3.4.3.1: Number of research papers in the Journals notified on UGC website during the last five years

Index Page

Principal
Chaitanya Bharathi Institute of Technology
(Autonomous)
Gandipet, Hyderabad-500 075

P i –mzq tfi [wl i : Tzwkmml qvofi 52 (2022) 873 881

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journal homepage: www.elsevier.com/locate/matpr

[w i zl fi fi fi–i qvi j tmkwwfi–z k–qw –pzw op –pmi xxtqki –qw wntw ki zj ww nww–xzqv – xzwl k–fi

N. Wi vm–pi [a],] . Mpvfiw Dtmvoi zi u [a,*], Dpu ml P i pu w l Dtvi ppi t [a], Z. Ni z–pqks [a], b .Mb i v e zqvi [a], N.MWi w [b]

[a] Hr r s T mv r H o v i rou t (HIHi), I r m r s Hv v K tv rr v t, Lmo s K tv rr v t, l v r v s c mm m, A3B37 a mmb , c mm vm
[b] Humvm mGummuv T v r s i rou t , Mn pv r , S pr mmp, A333CA i r m tm mh mr, T pvm

ARTICLE INFO

F vo r uv E
Wikmq ml 31 Mt 2021
Wikmq ml qv zm qfiml nwzu 16 Zmx–mu j mz 2021
Dkkmx–ml 19 S k–wj mz 2021
D iqi j tmww tqvm 10 Rw mu j mz 2021

ar p E
Lvl fi–zqi t j -xzwl k–fi
Oqp– nopp– kwwkzm–m
Gmu ww fi–zi –qw xzwmk–
Ow -kwfi– u wl mt ozmmv pw fim
J mwxwt u mz kwwkzm–mpw fim
Gqfifimu qvi –qw

ABSTRACT

[pmxzwl k–qw wnkmu mv– omvmzi –nfii ti zomi u w v– wnozmmvpw fimoi fimu qfifiqwfi; qv i l l q–qw, –pmfiki zkq– wnvi – zi t zmfiw zkmfi fiml qv –pml m mtwxu mv– wnj qt qvo u i –mzqi tfi i vl xzwl k–fi pi fixzwxmtm u i v ow– mzvu mv– fi, vww–ow mzvu mv– wzoi vq i –qwfi, kwwfi–z k–qw i vl kmu mv– qvl fi–zqmfi, i vl znfimi zkpmzfi i zw vl –pmotwj m– wqv mfi– –pmoz –qu mi vl mvmzo –w i zl fi zml kqvo –pml mmxmvl mvk wn –pmvi – zi t u i –mzqi tfi; wu mxwfifiqj tm i wnikpqmqvo fi fi–i qvi j qtq– qfi –pzw op –pm –qtq i –qw wn –pmtwki tt i iqtqi j tm i fi–mwz qvl fi–zqi t j -xzwl k–fi i i xi z–qt wz pwtmzmzti kmu mv– wnz –pmkww mv–qw i t u i –mzqi tfi.] vq mzfiq– wn P i ti i (] P) pi fi u i l mi u mi vqvon t kwwzq –qw qv –pml m mtwxu mv– wn fi fi–i qvi j tmj qt qvo u i –mzqi tfi i vl l mu wfi–zi –qw xzwmk–fi.] P qfi –pm zfi– vq mzfiq– qv P i ti fiq –wj qt l i kmu mv– –zmmpw fimw q–fi ki u x fi [w fiqvotm–fi–wzm pw fimfi, vi u mt Ow -Fwfi– P wl mt Kw fim (OFP K) i vl J mwxwt u mz Fwwkzm–m Kw fim (J TFK) pi mj mmv j q– fiqvo mv qzwwu mv–i tt mzqmvl t u i –mzqi tfi q–pqv –pm vq mzfiq– ki u x fi. Owki tt i iqtqi j tmi ozqk t– zi t i vl qvl fi–zqi t i fi–mi vl j -xzwl k–fi fi kp i fi xi tu wq t n mt i fi p (TS ID), xi tu wq ktqvs mz (TS F), u i v ik– zml fi i vl (P -fii vl), i vl fi–mmt fi tio i ooznoi –m (ZZD), mzm fiml qv –pml m mtwx– u mv– i vl kwwfi–z k–qw wn –pmfimpw fimfi. Dxi z– nzwu –pmu i –mzqi tfi, mv qzwwu mv–i tt mzqmvl t u m–pwl fi wn kwwfi–z k–qw mzmi tfiwi l wx–ml. [pq fii z–qktmu i qv t m i t i –mfi –pmfi fi–mu wnkwwfi–z k–qw i vl –pmi xxtqki –qw wn fi fi–i qvi j tmj qt qvo u i –mzqi tfi fiml qv –pm OFP K & J TFK i twvo q–p q–fii l i v–i omfi qv –mzu fi wn mv qzwwu mv–, mkwwwu i vl –pmfiwkqi t i fixmk–fi. S mzi tt, q– ki v j mkwwkt l ml –pi – i l wx–qvo ozmmv –mkpvwt– wo i vl qvkwzxwzi –qvo i fi–mj -xzwl k–fi qv kwwkzm–mpi fi v u mzw fi i l v i –i omfi. [pmzm qfiqw qv –pmkww– kzm–m u q nfi j fiqvo i t–mzvi –q m fi j fi–q– –m u i –mzqi tfi mzwu i fi–mxzwl k–fi w tl xi m –pm i nwz zml kqvo mv qzwwu mv–i t xzwj tmu fi, pi zu t mmk–fi wn i fi–ml m–wq xzwxmz l qfixwfii t u m–pwl fi, zmtqi vkm wv vww–zmvm ij tmfi j fi–i vkmfi i vl xzwu w–qw wn fi fi–i qvi j tmkwwfi–z k–qw. [pmxzqu mq ni wnj qt qvo –pm OFP K i vl J TFK qv] vq mzfiq– wn P i ti i ki u x fi qfi –wzi qfimi i zmvmfifiw –pm –tq i –qw wn i fi–mi vl qvl fi–zqi t j -xzwl k–u i –mzqi tfi; n z–pmz, –pml qfifimu qvi –qw wn –pmqvnwzu i –qw qfi –wm xi vl –pm fimwn –pmfimu i –mzqi tfi i vl kwwfi–z k–qw xzi k–qkmvw–wt qv P i ti fiq, j –i tfiw qv w–pmz kw v–zqmfi.

1.

Fwwkzm–m qfi i l zi j tmj qt qvo u i –mzqi t u i v ik– zml j kwu - j qvqvo Szl qvi z Twz–ti vl kmu mv– (STF), i –mz, i ooznoi –mfi, i vl i l l q–q mfi qv fixmkq k y i v–q–qmfi. Lv kww–zi fi– –w –pm 1990fi, otwj i t kmu mv– l mu i vl qfi mxmk–ml –wzqfimj 115 180% j 2020, i vl j 2050, q– qfi mfi–qu i –ml –wqvkzmi fimj 400% [38]. G m–w –pmm –zmu m

zi xql l m mtwxu mv– wnqvnzi fi–z k– zm, –pml mu i vl nwz kwwkzm–mpi fi fis zwks m–ml, u i s qvo q– –pmfimkwvl u wfi– kwu u wvt fiml zmfiw zkm i n–mz i –mz. Fmu mv– u i v ik– zqvo pi fi j mkwu mi u i rwz xzwj tmu j mki fimq– vw–wvt xwtt –mfi –pmi –u wfixpmzmj –i tfiw kwvfi u mfi ti zomi u w v– wn zmfiw zkmfi [30]. [pm qv–mzz x–qw wn kww–qv w fi fi xxt wn zi u i –mzqi tfi –w –pmkwwfi–z k–qw fimk–wz qt i mmk– –pm kw v–z ’fi mkwwwu qk ozw –p. [pmqu xi k– wn –pmfiki zkq– wn –pmfimm j qt qvo u i –mzqi tfi qt tmi l –w qvpqpmzkwwfi–z k–qw kwfi–fi i vl –pmv –pmj zl mv qt t j mxi fifiml –w –pmmvl fimzfi, pqkp qv – zv qt t ivmmk– vi –qwi t ozw –p (Lfiu i qt r m., 2013). b q–p znoi zl –w –pmpopp kww–

* Fwzzmfixwvl qvo i –pwz.
K- mv mpp r ErwpvfiwC u .ml .u (] .MDtmvoi zi u).

p––xfi://l wq wzo/10.1016/r.u i –xz.2021.10.275
2214-7853/Fwx zqop– © 2022 Htfimqmz O-I . Dtt zqop–fi zmfimz ml.
Zmtmk–qw i vl xmmz–zm qm vl mz zmfixwvfiqj qtq– wn –pm fikqmv–q k kwu u q––mm wn –pm Lv–mzvi –qwi t Fwvnmzmvkm wv Zu i z– i vl Z fi–i qvi j tm Gm mtwxu mv–fi qv P i –mzqi tfi, P i v nik– zqvo i vl Hvmzo Hvoqvmmzqvo

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Volume 62, Part 4, 2022, Pages 1785-1789

Experimental assessment of coir geotextile to improve the strength of weak subgrade at different load conditions

D. Harinder [a], P. Yugendar [b], S. Shankar [c]

Show more

https://doi.org/10.1016/j.matpr.2021.12.351

Abstract

The stabilization of weak subgrade soil with natural geotextile fiber is a cost-effective to improve the stability of the low-volume roads (LVRs). The coir geotextile is naturally available eco-friendly and biodegradable material having the high strength and durability compared to the other natural material. The present study, the test were conducted to determine the effectiveness of coir fiber and coir geotextile mats under the static and dynamic loading condition by using the CBR and WTT respectively. The inclusion of the coir geotextile fiber to the BC soil subgrade improved the load bearing capacity in soaked and un-soaked condition. The study was also conducted with two types of the coir mats under the repeated loading condition with help of the fabricated mould. It has two layer flexible pavement system like subgrade and sub-base are prepared according to CBR Standard.

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Hry vk Nk-s"r [a,*], W0 0J ku"rsxkw -r [b], T kvoqkw a-snr k- [c], R0 Pkqkxxknr k ' ky [d]

[a] i s sn pwkpw n 0Rs n s t Py y S vy ss y v0g n yn m y s y 0l n n E::::: G0c ryn
[b] K pyn s h ts 0Rs n s t Py y S vy ss y v0PO d 0Un ry s 5E::: GE0c ryn
[c] i s sn pwkpw n 0Rs n s t Py y S vy ss y v0PO d 0Un ry s 5E::: GE0c ryn
[d] h ts 0Rs n s t Py y S vy ss y v0PO d 0Un ry s 5E::: GE

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ABSTRACT

I yxm-o o s" myx"sno-on k" k " -yxq kxn n -kl vo myx" - msyx wk o-skv k" sxq y o- k mox - 0' osxpy-mon myxm-o o s" yxo kwyxq r o wy" zyz vk- wk o-skv" "on py- myx" - msyx k-y xn r o y-vn0' osxpy-mon myxm-o o s" " l tomon y no o-sy-k syx sx r k-"r ox s-yxwox " vsuo sx myk" kv -oqsyx"0 br o-opy-o. "o o-kv -o"ok-mr o-" k-o " -s sxq r k-n s r ros-oppy- " y k-n" no owyz sxq k xo wk o-skv y y o-myw o r s" z-yl / vow0 Gx ox syx ypvk-qo myx" - msyx zvkx " kxn ofi szwox k-y xn r o y-vn knnon y r o oxvk-qon "o yp myx" - msyx wk o-skv r smr r k" -ks"on r o m- ksx y r o "o ypknns s o wsxo-kvl z-yn m knws -o" y swz-y o r o fi kvs ypmyxm-o o0G" kx y myw o yp r o o zo-swox " kxn -o"ok-mr o". nowox /l k"on myx/ m-o o r smr woo " "zonskvzo-py-wkxmo s r -o"zom y " -oxq r. n -kl svs kxn y-ukl svs uxy x k" jjNOMN]K' L[' T GWI K I [WI ' KbK)N]I, s" l osxq no owyzon0 br s" myxm-o o mkx l o no"sqxon y qs o yz s/ ws on zo-py-wkxmo mr k-kmo-s" sm" py- k qs ox "o ypwyk. "kqo kxn o zy" -o myxns syx" myx"s" ox s r ro -ofi s-owox " ypmy" . "o- smo vspo kxn n -kl svs 0br o r sqr /zo-py-wkxmo myxm-o o nyo" xy -ofi s-o "zo/ mskvofi szwox l yxv xoon" mk-op vno"sqx kxn z-yn msyx0N]I r k" wkx kn kx kqo" vsuo vo""o- wsmy m-knusxq r kx myx ox syxkv myxm-o o kxn swz-y on n -kl svs mr k-kmo-s" sm"0 N]I s" r o myxm-o o no"sqxon y qs o yz sws on zo-py-wkxmo mr k-kmo-s" sm" py- r o qs ox "o ypwk o-skv0 "kqo kxn o zy" -o myxns syx". myx"s" ox s r -ofi s-owox ypmy" . "o- smo vspo kxn n -kl svs 0
Gx r s" zkzo-. myxm-o o s r nspp-ox q-kno" o-o o" on)T 52 y T :2, kxn nowox s" zk- skw -ozvkmon s r ro GSII [LOWK k nspp-ox z-yzy- syx" 2. 7%. 32% 37% kxn 42% y -on mo r o r ok ypr n-k syx. "y k" y no owz k n -kl vo myxm-o o s r ro knns syx yp"ksn wsxo-kvknws -o0I ywz-o""syx. az vs ox"svo kxn Lvo -kv o" " o-o zo-py-won yx myxm-o o yp nspp-ox q-kno" s r Gvnmy xo k" knws -o0I r owsmkv knws -o" o-o "on sx myxm-o o" ypr sqr o- q-kno")l o yxn T 72 q-kno, r o-o r o e 1H -k sy s" o- wy)sx r o -kxqo yp 20 4@ 20 57, y y o-myw o r o z-yl vow yp y-ukl svs 0br o myxm-o o s r Gvnmy xo r k" "r y x oxmy -kqsxq -o" v " myw zk-on y myx ox syxkv myxm-o o0

I.

Nsqr zo-py-wkxmo myxm-o o)N]I, ws -o" zy""o"" r sqr y-u/ kl svs . r sqr n -kl svs kxn r sqr vswk o" -oxq r0I yxm-o o. r y"o z-yzy- syx". sxq-onsox " kxn wo r yn" yp z-yn msyx. "zons mkw mry"ox y woo "zonskvzo-py-wkxmo kxn xspy-ws -ofi s-owox " r k mkxxy l o kv k " kmr so on l "sxq yxv myx ox syxkvwk o/ -skv". vsuo. nowox . kqq-oqk o". k o- kxn mr owsmkv knws -o". y- knyz sxq xy-wkvws sxq. zvkmsxq. kxn m -sxq z-kmsmo"0 br o"o zo-/ py-wkxmo -ofi s-owox " mkx l o r sqr ok-v " -oxq r. r sqr " -oxq r. wy zo-wokl svs . r sqr y-ukl svs . kxn r sqr n -kl svs py- " o o-o "o- smo ox s-yxwox " y- r os- myw l sxk syx"0 [1- 32] br o z-yn m/ syx kxn "kqo yp mr myxm-o o sx r o ovn xomo""s k o" o- " -sx/ qox fi kvs myx -yv kxn k r sqr noq-oo yp xspy-ws l o oox l k mr o"0 Nsqr zo-py-wkxmo myxm-o o mr k-kmo-s" sm" k-o no owyzon py- zk- sm vk- kzzvsmk syx" kxn ox s-yxwox ". "ywo yp r o z-yzo-/ so" r k wk l o -ofi s-on sxmv no: Nsqr " -oxq r. Nsqr ok-v " -oxq r. Nsqr wyn v " yp ovk" sms . Nsqr kl -k"syx -o"s" kxmo. Sy zo-wokl svs kxn nsp "syx. ' o"s" kxmo y mr owsmkv k kmu.

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H- spo zypo l l -pfiwlnpx py qz--t p- lyo ty pwqnzx fil n tyr -pfilt-x z-l- E ltylmwp zw tzy

c R-t syl]lz T fifil-t p [a,*,1]. Llpfl Esx po T zslx x po [b]

[a] l yw ,cws w yb d wwv ,b s s sass g w yowu (T),f vwstsv,ows s s ns wgvs
[b] cws w yb d wwv ,b s s sass g w yowu (T),f vwstsv,ows s s ns wgvs

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hw v S
_ ltylmwp x l p-tl w
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H- spo zypo ,H_l-
Lz yo- lyo,L_-

ABSTRACT

]l fito r-z s ty sp tyq-l - n -p z nl p- z sp opx lyo zqtyn-pl tyr fizfi w tzy t qz-ntyr pyrtypp- z styv sp-z p zq ltylmtw p py qz--pfilt- zqn-t tnl wtyq-l - n -p0_pwq/Hzx fil n tyr T z-l-,_HT-t zyp ns -pfilt-x l p-tl w ts -px pyoz lo l y lrp ty p-x zq pl p ty l fifiwtnl tzy lyo x pns lytnl wfi-zfip-tp 0asp fi-p py fil fip--pfiz- sp pqppn zq p zq lwp-yl p x l p-tl w qz--t p- lyo zy sp q-p s l p mpsl tz-,ml po zy x tyt c/q yypwl yo x tyt wx fi z p -lyo x pns lytnl wfi-zfip-/tp zq_HT),ml po zy 4:/ol nzx fi-p t p. fiw py twp l yo p -l w -pyr s - z l np-l ty sp x pns ly/tnl wmps l tz-. stwp z yop- lyo sp tyr-p zq x zt -p l yo sl-x q wns px tnl w s-z rs sp -pfilt-x l p-tl w z sp m -l p. z-fi t t p ,qz-o -l mtw - l fip-qz-x po0asp fil-l x p p- zq ty p trl tzy tynwop. fip zq l rr-prl p,]t p- lyo. n- spo zypo lyo qz yo- lyo-. x t fi-zfiz-tzy ,3A8 l yo 3A4-. t p zq yp l rr-prl p,609 7 x x oz y. 4058 x x oz y. l yo 308: x x oz y-. l yo l rp zq n -tyr ,4: ol -0E z l wzq447 fipntx py p-p nl lyo p po ty st o 0asp-p w l-p zq sp p topynp sl n- spo zypo l yp l rr-prl p sz po fip-tz-fip-qz-x lynp l yo nl y mp l tl mwp l wp-yl t p z sp nl-np-t p- lyo0

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_pwpn tzy l yo fipp-/-p tp yop--p fizy tmtw zq sp ntpy t n nzx x t pp zq sp Qy p-yl tzyl wHzyqp-/pynp zy _x l- lyo _ ltylmwp l p pwzfix py ty T l p-tl w. T l y q l n -tyr l yo Kyp-r Kyr typp-tyr

id

]l fito r-z s ty sp tyq-l - n -p z nl p- z sp opx lyo zq tyn-pl tyr fizfi w tzy t qz-ntyr pyrtypp- z styv sp-z p zq / ltylmtw p py qz--pfilt- zqn-t tnl wtyq-l - n -p0l p p-tz-l tzy zqnzyn-p p - n -p o p z n-l nvtyr l yo fil wtyr zq -q l np nz p- t l vp t p stns nz wo np-p zwpo t s fil ns -pfilt-. l tx fiwp l yo x z nz /pqppn t p zw tzy. m l fifiwtyr l q-p s -pfilt-x z-l-zy sp nz-p fizyotyr nzyn-p p0F . sp-pfilt-x z-l-l fifiwtpo z nzyn-p p t lwwsl-o z nzy zwtol p. l yo ty x z nl p tm-l tzy t yz fiz tmwp0d t s sp l t wlmtw zqyp r pyp-l tzy fiw tnt p-. t t fiz tmwp z l nstp p strs wtyr-l p p py qz-nzx fiwp x z wo px h3i0_pwq/Hzx fil n tyr T z-l-,_HT-t zyp ns -pfilt-x l p-tl w t s -px pyoz lo l y lrp ty p-x zq pl p ty l fifiwtnl/tzy lyo x pns lytnl wfi-zfip-tp qz--psl mtwl tzy lyo -pfilt-zq -ptyqz-npo nzyn-p p - n -p fil-tn wl-w l yl-z x z wo / px h4i0asp p zq ns px tnl wl ox t -p . t0p0 fip-fiw tnt p-lyo t nz t x zotq tyr l r py t l yp np t z tx fi-z p sp z-v/l mtw lyo pr-prl tzy -p t l ynp sp-pl sp tyn-pl p ty yp x l p-tl w nzy py ty npx py x zotq sp-spzwzr tnl wfi-zfip-tp zq sp fil p. ty pyntyr sp pwq/nzx fil n l mtw 0asp pwq/nzx fil n tyr x z-l-t ns l-l np-t po m t nl fil mt z z lyo z ww z sp x z -p -tn po fiwlnp zq sp qz-x z-v lyo pwq/opy t nl tzy t sz wz tyr s zx zr pypt lyo -p wtyr ty l x l p/-tl w sz p fi-zfip-tp ty sl-opypo l p l-p l wpl sp l x p l sl zqx z-l- nzx fil n po m tm-l tzy0asp-spzwzr zq_HH nl y mp zfi tx t po m fi-zfip-w op tr ty tyr sp yp fil- zq nzyn-p p l yo _HT x l p- p l l ml t qz-_HH op tr y lyo fi-zfip-tp zq_HT strswtrs sp z-vl mtw zq_HH h5i0Wyp zq sp px fiwz po pns/ytfl p z fi-zo np pwq/nzx fil n tyr x z-l- t z p yp x l p-tl w ty sp x z-l-. np top sp npx py 0asp loot tzy zqx l p-tl w zqs trs ypyp nl y nzy-tm p z tx fi-z px py ty x pns lytnl wfi-zfip-tp lyo o -l mtw 0Lz-tx fi-z tyr -pyr s lyo o -l mtw nsl-l np-t/tn zq pwq/nzx fil n tyr -pfilt-x z-l-,_H]T-. x typ-l wl oot t p fi-zo np l nzx fil n -n -p lyo x zotq sp l rr-prl p/npx py ty p-q l np zyp m fiz-p/ wtyr pqppn s-z rs l fiz zwlytn-pl n tzy qz-x tyr l yzy/ zwmwp H_N -n -p h3i0

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_pwpn tzy l yo fipp-/-p tp yop--p fizy tmtw zq sp ntpy t n nzx x t pp zq sp Qy p-yl tzyl wHzyqp-pynp zy _x l- lyo _ ltylmwp l p pwzfix py ty T l p-tl w. T l y q l n -tyr l yo Kyp-r Kyr typp-tyr

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Vy–rv r j –rxwxouxl j –rxwxox –firppnfifl fl–nv rw–j uuk rumrwpfl xo mroonfinw– j flynl – fij –rxfl

Wfij mmny I wmj [a,*], brv j uj Bw–q pj fir [b]

[a] r y v e :b v t :h vvw :i v
[b] d e :dcis:h vvw :i v

A R T I C L E I N F O

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V –firppnffl fl–nv
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A B S T R A C T

aqn m wj v rl knqj rxfixo–j uuk rumrwp fl–fi l – finflrfl wyfinmml–j kun wmnfi uj –nfij uuxj mfl/ aqn t n lxwl nfiwxo –j uuk rumrwp mnflrpw rfl l xw–fixuurwp mm nl–rxwfl wmnfi uj –nfij uuxj mfl utn nj fi–qz j t n uxj mfl xfi rwm uxj mfl/ aqnfin j fin v j w fl–fi l – fij uoxfiv fl–x finflrfl– uj –nfij uuxj mfl@–qn x –firppnfifl fl–nv rfl xwn xo –qn knfl–fl–fi l – fij u oxfiv floxfi nooml–r n uj –nfij uuxj mfinflrfl–j wl n rw –j uuk rumrwpfl/]rwl n –qn uxl j –rxwxo –qn x –firppnfi nwxfiv x flu rw nwl nfl –qn m wj v rl knqj rxfixo–j uufl–fi l – finfl– –qn yfinflnw– finflnj fil q oxl flnmxw wmrwp –qn xy–rv v uxl j –rxwxo –qn x –firppnfi j uxwp r–q –qn qnrpq–xo –qn fl–fi l – finfl/ Gxfi –qrfl l xw–nfl–j w v nfirl j ufl– m rfl l j fi finmx – r–q n fl–fi l – fij uv xmnufl xomroonfinw– j flynl – fij –rxfl/ aqn j flynl – fij –rx xo –qn v xmnufl l xwflmnfinmrfl 1/: 2-1/72-1/56-1/47 j wm 1/41/ Buu n v xmnufl j fin mnflrpwnm j flynfiMwmj wl xmnfl–N/1567–j wmN/129: 4/ Gxfi –qn xkfl nfi j –rxwxo –qn m wj v rl ynfioxfiv j wl n xo –qn n v xmnufl– –qn x –firppnfi–fi flfl r–qx –j w knu––fi flfl rflyuj l nmj – mroonfinw– qnrpq–fl xo –qn k rumrwp/ Gxfi nj l q yxflr–rxw– –qn m wj v rl ynfioxfiv j wl n xo –qn 4E fl–fi l . – fin rfl xkflnfi nm/ aqn fl– m rfl v j m –x l xv yj fin –qn finm l –rxwfl rw mflyuj l nv nw–fl– rw–nfi fl–xfi mfiro–fl– j wm x nfi– fiwrwp v xv nw–fl oxfi –qn k rumrwpfl r–q j wm r–qx – x –firppnffl/ aqrfl fl– m oxl flxw–qn lqj wpn xo –qn yxflr–rxw xo –qn x –firppnfi oxfi pfinj –nfi finflrfl–j wl n –x uj –nfij uuxj mfl mynwmrwp yxw –qn j flynl – fij –rx xo –qn k rumrwpfl/ aqn j wj u –rl j ufinfl u–fl qj n knnwfl– mmm–x wmx – –qn xy–rv v uxl j –rxwxo –qn x –firppnfi j uxwp r–q –qn qnrpq–xo –qn fl–fi l – finfl r–q mroonfinw– j flynl – fij –rxfl/ M j fl l xwl u mm–qj – –qn xy–rv v yxflr–rxwxox –firppnfi–fi flfl r–qx –knu––fi flfl rflj –76 –x 91% xo –qn qnrpq–xo –qn k rumrwp oxfi j flynl – fij –rxfl kn– nnw 1/56 j wm 1/: 6/

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axmj (fl rwl finj flnrwyxy uj –rxwunj mfl–x –qn finz rfinv nw–xoqrpq. firflnk rumrwpfl rw v n–fixyxur–j w l r–rnfl/ Mw –j uuk rumrwpfl m firwp –qn xl l ffinwl n xo uj –nfij uuxj mfl– qrl q qj fl qrpqnfi fl j k v xfin flunw. mnfiwnfifl/ c qnw –qn qnrpq– xo fl–fi l – fin rwl finj flnfl– –qnfin v fl– kn j wn l nunw– uj –nfij uuxj mfinflrfl–rwp fl fl–nv x–qnfi –qj w fl qnj fi j ufl –x j xmmj –nfij uuxj mnooml –flrwl n –qn flqnj fi j ufl j fin y –x j flynl r l fl–xfi qnrpq–/ V –firppnfifl fl–nv fl j fin xwn xo –qn knfl– nooml–r n fl fl. –nv fl– qrl q j fin nj flmfi–x k rum–l xfl–fli rwp–j wmyfix mm kn––nfi uj –. nfij u fl–roownfifl/ aqn x –firppnfi kfij l nm fl–fi l – finfl qnfin –qn l nw–fij u l xfin rfl l xwwnl–nm –x –qn x –nfi l xu v w rfl j wm no l mw– fl–fi l – fij u oxfiv / V –firppnffl j fin mny– fl–roo knj v fl –qj – l xwwnl– n –nfixfi l xu v wfl –x –qn l xfin j uu–x t nny –qn l xu v wfl rw–qnrfiyxflr–rxw–rw– fiw– finm l rwp –qn fl j / aqnfln j fin fl–roo j fiv flnwpj prwp x –nfi l xu v w –x l nw–fij ul xfin –fimfl–x –ru–x –firppnfi un nurwm l nflj –rwfl rxw l xv yfinfl. flrxw l x yun rw –qn n –nfixfi l xu v wfl j l–rwp rw xyyxflr–rxw –x –qj – v x nv nw– j l–rwp xw –qn l xfin j – –qj – un nu xo x –firppnfi fl fl–nv / aqn x –firppnfi fl fl–nv qj fl knnwj wn ooml–r n j wm nl xwxv rl j ufixu . –rxw oxfi flunwmnfi –j uuk rumrwpfl rw v r–rpj –rwp finflfv rl finflyxwflnfl/ Mw –qn l xw nw–rxwj u x –firppnfi fl fl–nv fl– –qn x –firppnfi –fi flfl l xwwnl –fl –qn ynfirv n–nfi l xu v w –x j finj –r nu fl–roo l xfin fl–fi l – fin/ c qnw uj –. nfij uuxj mfl– fl l qj fl flnrflv rl xfi rwm uxj mfl– j fin j yyumm –x –qn k rum. rwp– –qn x –firppnfi fl fl–nv j yyumfl j finflrfl–rwp v xv nw– xw –qn l xfin fl–fi l – fin k v xkrur rwp –qn fl–roowflfl xo –qn ynfirv n–nfi l xu v wfl/

aqn flnunl–rxw xo rw–nfl– v nj fi finfl)M fl, rfl j l fir–rj u fl–nyfl n oxfi –qn flnrflv rl mnflrpw xo [D –j uuk rumrwpfl [2h]/ Vwn xo –qn knwn –fl xo x –firppnfi rfl –qj – r– nwqj wl nfl x nfij uu fl–fi l – fij u fl–roownflfl– j wm –xy mfiro– rfl xo–nw l xw–fixuunm wmnfi uj –nfij u uxj mfl/ aqn x nfi– fiwrwp v xv nw– rfl xo–nw kj uj wl nm kn– nnw –qn ynfirj ynfifij u uxfij v n j wm l nw. –fij u l xfin j ufl k –qn x –firppnfffl [3h]/ C –ru rwp –qn k l turwp.

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]nunl –rxw j wm ynnfi fin m wmnfi finflyxwflrkru– xo –qn fll mw–r l l xv v r––nn xo –qn Mw–nfiwj –rxwj u Dxwonfinwl n xw]v j fi– j wm] fl–j rwj kun En nuxyv nw–fl rw S j –nfirj ufl– S j w oj l – firwp j wm Fwnfip Fwprwnnfirwp

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F ylx tn fip qz x lynp zq zq/ z p n p t s rl fi pwpx py l mpl x /nzwx y uzty

S o wl Esly x zw [a,*], F 0dtx lwl Cy s rl t [b]

[a] m t r d y vv y: U ry o v : e uv rsru: f u r
[b] c v r v wb d y vv y: bafn: e uv rsru: f u r

A R T I C L E I N F O

U t v T
C l twlmp zywtyp 44 Vn zmp 4243

gv u T
azq/ z p
I l fi pwpx py
] p fizy p fipn x
a z p ot fiwlnpx py
M p/ z p o tq l tz
V p/ ytyr x zx py

A B S T R A C T

azq/ z p n p l p x z p npfi tmwp z q tw p qz pt x tn tml tzy . stns t pwlwyz y z sp z wo0D . ty x wt/ z p l fil x py . t t l fi l n tnp z fi z top l fil vtyr fiwlnp l sp r z yo z p . tyo ntyr zq/ z p pqpn 0M sp fi p py o . ly pqz t x lop z po np sp zq/ z p pqpn zy sp n p) o ylx tn fip qz x lynp m ty zo ntyr ly l lyrpx py zq rl fi pwpx py l mpl x /nzwx y uzty 0bz sl nzy p . l y x p tnl wl p x py t nl tpo z z ns pnv sp fip qz x lynp zq sp]E n/ p0bs p rl fi pwpx py t x zopwpo l l fi tyr pt sp ty l mpl x z ty l nzwx y z nz s0 bs p p pl ns sl mppy fip qz x po ty z fil A s p fil zq sp lylw t t qzn po zy zfi tx t tyr sp rl fi pwpx py fil p y0F tl rzylwnzx fi p t p pfiwlnp sp ty ww lww .lyo sp r z yo z p t x zo/ pwpo l ly zfipy r z yo z p t sz ty ww lww. stns t nzy top po l zq/ z p 0Hzx sp fil . ly zfi tx lwrl fi pwpx py fil p y q zx potqp py l mt l fil p y t zml typo q zx sp p w zqwtypl o ylx tn p fizy p fipn x lylw t .opfipyotyr fizy sp nzx fil t zy zq l tz pt x tnfil lx p p 0bs p pnzyo fil zq sp lylw t ty zwp ns pnvtyr sp pqpn zq sp rl fi pwpx py) zfi tx t po fil p y qz qz wp pw zq n p t s p tnl ww l tpo l fipn l tz 0]p fizy p fipn x lylw t t fip qz x po. lyo l o t nzyo n po z nzx fil p sp pt x tn fil lx p p qz sp qz wp pw0bs p x zopw t s rl fi pwp/ x py sl p sz y ly l fifil py po n tzy ty z p ot fiwlnpx py . ty p/ z p o tq l tz . z p/ ytyr x zx py . lyo tyn px py ty z p tqqyp s py nzx fil po z sp nzy py tzylwx zopw. s p stmt tyr nzy n t p z nzx p 0
Ezfi trs © 4244 Gwp tp R o0C ww trs p p po0
apwpn tzy lyo fipp / p tp yop p fizy tmtwt zq sp ntpy t n nzx x t pp zq sp M p yl tzylwEzyqp / pynp zy ax l lyo a l tyl mwp F p pwzfix py ty S l p tl w. S l y qln tyr lyo Gyp r Gyr typp tyr

I 1

V p sp fil qp opnl op . tryt nly p pl ns sl mppy ot pn/ po z l o n p p stmt tyr zq/ z p x pnslyt x 0 Cnnz y tyr z M@ 3: ; 5,[l 3-/4238. zq/ z p pqp z sp z p zql n p sp p t wl p l w tqqyp t wp sl y sl ty sp z p lmz p0bs p z p wl p l w tqqyp t sp z l w tqqyp zql ww sp pt x tn qz np/ p t tyr pwpx py sl p t wl p l wpl s/ – l vp sl vtyr pqpn ty sp nzy top po ot pn tzy0bs p l m pynp zq x l zy ty ww lww l sp r z yo z p wp pwzq ptyqz npo nzy/ n p p ,]E- m twotyr ty zo np oopy ot nzy ty t tp ty sp wl p l w pyr s lyo tqqyp lwzyr t s t sp trs 0bst p w ty ly p np t p wl p l wwzlo lyo typwl tn opqz x l tzy opx lyo zy sp r z yo z p nzwx y wplotyr z sp m twotyr) zq/ z p nzw/ wlfi p yop sp pt x tn wzlotyr nzyot tzy 0L pynp. sp z p ot / fiwlnpx py 1opqz x l tzy. ty p/ z p o tq . lyo z p tqqyp fiwl ly p py tl w zwp ty sp pt x tn op try zq zq/ z p n p0

bs p fi p tz z v rl p x l y zw tzy ty st prl o0 *ag nar SEDB k gsB* [3-6] op pwzfipo nl fil nt n p qz ptrs otqqp py pyr spytyr ns px p lyo ns pnvpo spt pqpn t pyp ty tx fi z / tyr sp fip qz x lynp zq zfipy z p] E q l x po n p0 *Ho o dgugu egnyy guj H mk n FBdgo* [35] fi p py po sp l y l w tnl w p l w l tzy zq z pns yt– p z x t trl p sp zq/ z p pqpn 0 bs p tynwopo sp nzwx y p z t s fil tl w ppwl nvp tyr lyo q wwp z t s l wx tyt x spl wtyv . qz yo sl sp q wwp z x zopwpqpn t pw nzy zwpo sp o tq p fizy p lyo l ns tp po sp op t po tpwo x pnslyt x 0 *Cj ogu Mkj oir FBH g k gsB* [33] op p / x typo sp pt x tn fip qz x lynp zql m twotyr yop otqqp py t pr/ wl t nzyot tzy . fi zfiz po nz p x zot p qz sp nzy top l tzy zq sp p p t zq t v ty sp n p0 *c kmt k CBayt* [3i]

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4436/9: 751Ezfi trs © 4244 Gwp tp R o0C ww trs p p po0
apwpn tzy lyo fipp / p tp yop p fizy tmtwt zq sp ntpy t n nzx x t pp zq sp M p yl tzylwEzyqp pynp zy ax l lyo a l tyl mwp F p pwzfix py ty S l p tlw. S l y qln tyr lyo Gyp r Gyr typp tyr

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A R T I C L E I N F O

K t w l
E owzopzs –zwvs

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A B S T R A C T

Lo v oys o s vsfi – srwqopzso–r rs o o w-u tozz–o ozrwo s 1R- ws t vss s– ws rofi ous wqo–qo s/ww s fi qv–sqs o –rs o–r vs swfiwqs – s tp vwr w-u –rs o0 w q –rww– 1a–s qv w o w–wp vwr w-u ww zo–w su zo w /o–r s oqvozs–us q oz s–uw-ss psqo s t vs rofi ous wqo–qo s1evs s w–ozwsu zo p vwr w-u o s pxsq sr zo us o w– op vs s wqozo w r s vs sqqs– wqw ps ss–qs– s t fi o o–r ww qs– s t wuw r0 w 1eopzs 8 tRl 4@A6, bo 04-B5349 fis– w– s0s– o– q –s /zo us q w- vs zop /– –0 o ozzsz zo s ozt qs sfi o s fis t vs qo s t w–ozwsu zo w 1evs s p vwr w-u wzvo s w–oz fi rs o vs t –rofi s– ozfi rs o–r vzps pxsq sr s s– ws rofi ous r w-u swfiwqoq ww 1R- w0 o w– vs s vs w su zo vo s w ws wopzs psqo s t o qvwsq ozo–r t –q w–ozrsfi o–r / vs q ozs–uw-ss vo –r fi so– o– t fi vs t –rofi s– ozfi rs vo s t fi w–ozfi rs o– zo w–ozfi rs1Errw-u q oz ozz /p oqw-u o vs o vw s z qo w– o s o ts t vs wopzs z w– 1R- vs s s– r /o– o sfi w fi o rs w- s wuo s vs o vw s z qo w– o–r us fis t q oz ozz t ts w–ozwsu zo p vwr w-u 1evs s0rwfi s– w–ozr –ofiwqo–oz w ,cs – s d sq fi] s v r- t 48 vwr [o–r I 0 vo s p vwr w-u wqo vwr o s Rl 4@A6, o 4- w-u LeEFd1 cs – s o– ww zwys ewfi s bs wr / Fo s dvso / d s] fis– /] roz bo wqwo w– toq /S w- rw zoqsfi s– /d s J w o s s ozo sr1E q fi o o ws r w fi o rs o ws o vs wfi fi z qo w– t vso ozz ww fi w-wfi fi w– rw zoqsfi s– o–r vs s o– zo0 w–ozfi rs psq fi s vs t –rofi s– ozfi rs1

dszsq w– o–r ss 0 s vw –rs s – wpvww t vs qvw– wq q fi fi w ss t vs R- s –o w–ozI –ts 0 s–qs – J s w–/] o– toq w-u o–r] o s woz L–uw-ss w-u1

nd

e w–ozwsu zo w w-p vwr w-u zsor sqqs– wqw ps ss–qs– s t fi o o–r qs– s t wuw w vwqv qo s q – ww s opzs o w– op vs s wqozo w/ vs s w–oz o w– qo s orr ww–ozt qs w- vs zo s ozz or s w w-u sfi o–r fi o zsor rofi ous t vs p vwr w-u1cs0s– o– q –s /zo us q w- vs zop /– – o ozzsz zo s ozt qs sfi o s fis t vs qo s t w–ozwsu zo w 1evs s p vwr w-u wzvo s w–ozfi rs o vs t –rofi s– ozfi rs o–r vzps pxsq sr s s– ws rofi ous r w-u swfiwqoq ww l7 8m, ss eopzs 4 7-1

evs t –rofi s– ozfi rs vo s w o– w-r wqo t vs sr fi w0 –o– rst fi o w– qvo oq s w wq t vs p vwr w-u1e o ww vs vwz sttsq t w–/ww oz o rs wopzs vo s o– zo w–ozfi rs o vs t –rofi s– ozfi rs1M p vwr w-u vo s u r swfiwq s – s vs wfi o– w s w wfi zs o–r su zo q – u o w– o–r yss w-u vs –rs wopzs s – s w- ww /rs w-s v zr o ww su zo vo s 1F w- w o w– vs s vs w su zo vo s w ws wopzs psqo s t o qvwsq ozo–r t –q w–ozrsfi o–r /t ps s q oz s t fi o–qs/ vs t –rofi s– ozfi rs vo s w ps o– t fi sr t fi w–ozfi rs o– zo w–ozfi rs1Errw-u q oz ozz /p oqw-u o vs o ww s z qo w– o s o ts t vs wopzs z w– l9 : m1

evs s s– yo sfi ww s– ww vs o w wpzs z qo0 w– o–r ws t q oz ozz q – s vs w–ozfi rs w- o– zo w–ozfi rs/evs vww– t q oz ozz vwz vw vs qs– s t w ww o–r w ww vwsr o vs o ww s z qo w–/ zr vw w –so s vs qs– s t fi o o–r sr qs vs sqqs–0 wqw 1M o qv s–z qo w–/ vs ww v t vs q oz ozz w qoz0 q zo sr s o w-u qs– s t fi o o–r qs– s t wuw w /L oz o w– t fi rs vo s /fi o wfi fi zo s oz rw zoqsfi s– /po s vso / s r w o–r s fi fi s– t zo– w su zo sw-t qsr q –0 q s s p vwr w-u vo pss– qo vwr p vs s t z w-so r –ofiwq o–oz w, cs – s sq fi o–oz w-1evs fi rsz s s o–oz sr p LeEFd 5348 t o s l@ Am1

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VaT

ABSTRACT

Vpl- -q np x z y po x p szo ,VaT - t ly px p-rtyr pnsytfl p t s top- nzfip ty -pfil t-lyo -ps l mtw0 t l tzy1Ny st x p szo l wp p--pfil t-x l p-tl wt po lyo l K] Y t fiwnpo ty top r-zz p t zqp- strs p- p- tnpl mtw /-p t lynp z nz-z tzy/strs p-tx fil n olx l rp -p t lynp lyo -p -p t lynp s p-p m fi-z0 totyr strs p-wzyr0p-x pnzyzx 1bst x p szo zq -pyr spytyr l zto lo p- p py t-zyx py l wtx fil n / ty p- fi tzy z p- tnp s p-pqz-p nzy top-l mwp l tyr ty tx p lyo nz 1Mpynp/VaT pnsytfl p spwfi ty m twotyr -p twpynp ty z tyq-l -n -p px 1bst filfip-t z fi-p py s p p fip-tx py l w z-v zy pys lyn0 tyr p -l wfip-qz-x lynp zq -ptyqz-npo nzyn-p p mpl x m tx fiwpx py tyr VaT x p szo1bsp top ypl -0 -q np x z y po ,a0VaT - t ly l wp-yl t p x p szo po qz-l fifiwtyr m-p -ptyqz-npo fizwx p- ,K] Y- p 0 -l w -pyr spytyr zy -ptyqz-npo nzyn-p p ,] H- mpl x l ty fi-l n tnl wl p s p mz zx q np zq s p mpl x x l mp zx p tx p tyl nnp tmwp1bsp a0VaT x p szo fiwnp s p K] Y r-zz p l s p top zq s p mpl x zy pt s p- top/-l s p- sl y l s p mz zx ty s p yz-x l wypl - -q np x z y po ,VaT - x p szo1bsp fi-p py o t nl --tpo z zy s p p zq VaT qz- -pyr spytyr zq] H op ntpy mpl x op tryo qz- 63vV t s VaT nzx fiz t p x l p-tl wyl x pw rw m-p -ptyqz-npo fizwx p- ,LK] Y- -tfi l -ptyqz-npx py 1bsp p fip-tx py l w z-v tynwopo nzy -zw fipntx py lyo s p spypo mpl x l otqqp-py wnl tzy lyo z-tpy0 l tzy zq LK] Y sl t mz s mz zx VaT lyo top VaT x p szo ,mz s s z-t zy l wlyo p- tnl wz-tpy l tzy zq -tfi - l -p otpo lyo s p p mpl x l -p mpn po z z fizty mpyotyr p -l w p 1bsp pqqpn zq r-zz p wnl tzy/n-l nv fil p-y/op pn tzy l x to fil y lyo fl l -p- fil y lyo l wz otqqp-py x zop zq q tw-p l -p s p nsl -l n p-t tn otpo ml po zy -p w zml typo1

Hzfi -trs © 5355 J wp tp- S o1Fw -trs -p p- po1
apwpn tzy lyo fipp-0-p tp yop- -p fizy tmtw zq s p ntpy t n nzx x t pp zq s p Ny p-yl tzyl wHzyqp-0 pynp zy ax l- lyo a l tyl mwp I p pwzfix py ty T l p-tl w/T l y q n -tyr lyo Jyp-r Jyrtypp-tyr

1.

bsp fi-znp zq tx fi-z tyr s p - n -l wfip-qz-x lynp zq s p - n -p yop- p t tyr wzlo z- nl — tyr loot tzyl wwzlo t vyz yl - n -l w -pyr spytyr 1bsp-p t lynp t zq -pyr s0 pytyr o p z op p-tz-l tzy/nslyrp ty p/p-z- ty nzy - n tzy z- z-vx ly s fi p--z- [4 7] 1Ktmp-0-ptyqz-npo fizwx p- -pyr spy0 tyr t rl tytyr z-wo top fizfi wl-t 1b fip zq K] Y -pyr spytyr l -p p p-yl ww nzyopo -ptyqz-npx py ,J G] - lyo ypl - -q np x z y po x p szo ,VaT -1Ny s p J G] x p szo/ s p -q np zq s p] H pwpx py t nwpl ypo1K] Y s pp z- wlx tyl p l -p p p-yl ww nzyopo t s l fifi-zfi-tl p wp-x l tyw pfiz 1Ny s p VaT x p szo/ nzyn-p p nz p-r-zz p l -p n lyo K] Y -ptyqz-npx py t px mpoopo t s r-zz p wp-/yl x pw pfiz 1bsp top ypl -0 -q np x z y po ,a0VaT - x p szo t ly l wp-yl t p x p szo zwzr po qz- l fifiwtyr m-p -ptyqz-npo fizwx p- ,K] Y- ml- z- wlx tyl p qz- p -l w -pyr spytyr zy -ptyqz-npo nzyn-p p ,] H- mpl x 1e s py nzx fil -po z s p VaT x p szo/ s p a0VaT x p szo nzy t zq r-zz p l s p top zq s p mpl x -l s p- sl y l s p mz zx q np [8 8] 1

bsp l o lyl rp zq K] Y/ nzx fil -po z ppwl VaT -ptyqz-npo0 x py / l -p s l K] Y fi-z top mp p- fi-z pn tzy l rl ty nz-z tzy/ pl ty lww tzy mpnl p zq t wrs ptrs /lyo l opn-pl p ty s p t p zq s p r-zz p1VaT 0K] Y -zo l -p s p x z -pnp pnsyzwzr qz- tyn-pl tyr s p p -l w -pyr s zqop ntpy] H x px mp- [43 48] 1dl -tz p fip-tx py l w z-v ozyp zy s p p -l w -pyr s py0 tyr zq mpl x l -p fi-z topo ty s p wt p-l -p1Ny 5347/ F l o1a1Fot p l wr otpo s p l fififwnl tzy zq otqqp-py to s zq LK] Y t s z po sl s p tyn-pl p ty LK] Y l -pl py -p mp p- nzy -zwzy op pn tzy lyo op pwzfix py zq n-l nv ty s p nzyn-p p o p z p -p1 Fy p fip-tx py l w o fip-qz-x po m I p1 Sz-py t p l wr sz po l y

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55470 A862 Hzfi -trs © 5355 J wp tp- S o1Fw -trs -p p- po1
apwpn tzy lyo fipp-0-p tp yop- -p fizy tmtw zq s p ntpy t n nzx x t pp zq s p Ny p-yl tzyl wHzyqp-pynp zy ax l- lyo a l tyl mwp I p pwzfix py ty T l p-tl w/ T l y q n -tyr lyo Jyp-r Jyrtypp-tyr

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cfl rq pr ur pn oflfi sflfl – vfi s flz ur – flq p vlfi fls] fl ynfiq prz rfi . ur r v r vrz rfi fls p rn vfit fl ur oflfiq – flq prq z n r vny fl z nxr pflfip r r0Ofi uv pflfifirp vlfi r r nyrssfl n r – sfl n q fl qr ryfl– ovfiqr vu –fl flynfivpz n r vny vu ufl prz rfi . sfl uv nqqvvlfi fls purz vpny v fin flvqnoyr fl pn r rnp v r. uv fl x vfi fly r ur r fls n u. arp pyrq ntt rtn r. nyxnyfir np v n rq vq 0 Dyxnyfir fl ovfiqr n vfl v 2077 vu r punfitr fls 322% prz rfi vu n u nfiq qr r z vfir ur rfit u sfl 46u fl rfi p vfit n rz –r n r 82 °F nfiq 4: qn n z fl –ur vp p vfit0Ofi uv fl x n r z n r vny n u nfiq L L E I b n r nxrfi vfi ur – fl–fl vlfi fls 92A520cur – fl–fl vlfi fls bflqv z bwpn r nfiq bflqv z M q fl vqr v nxrfi n 407 nfiq ur nyxnyfir yw vq fl ovfiqr n vfl v nxrfi n 2070cur z flyn v fls ur nyxn/ yfir fly vlfi v nxrfi n : T nfiq 32 T 00fi uv fl x. ur pfln r ntt rtn r un r orrfi r–ynprq o rp pyrq ntt rtn r sfl qvssr rfi – fl–fl vlfi vt02%. 47%. 72% nfiq 322% ur z rpunfivpny – fl–r vr pu n pflz / – r v r rfit u. b–yw crfi wr nfiq I yr ny b rfit u n r r ny n rq0

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Fflfip r r v rq n yn tr z n r vny sfl ur pflfi p vlfi ryq r r vfipr ur r v r–ynprz rfi sfl pflfip r r n n o yqvfit z n r vny. uvpu v un vfit ur nowy fl or z fl yqrq vfi fl ur r vrq un–r. orpn r ur pflfip r r un ur –yn vpv – fl–r 0E uvpu un r yfl q p wy [3.4]0cur vfisr rfipr v q n fi s flz uv un ur ufl p vfit –ynpr n z nwl flyr vfi trfl/–fly z r v n vlfi0cur L L E I b vz – fl r ur rfit u n nvfiz rfi n yn r ntr nfiq r vfit – flpr [5 7]0

cur nq nfiprz rfi vfi Fflfip r r rpufiflyflt . fir nyr fin v r prz rfi v vfl z n r vny n r rq rssrp v ry fl vfip rn r ur pflz / – r v r rfit u nfiq ny fl rfiunfipvfit ur q nowy fls pflfip r r0 cuv vfip rn r ur prz rfi – flq p v v tyflony nfiq vfi fi vfip rn r ur pn oflfi qvfl vqr rz v vlfi vfi fl ur n z fl –ur r0cu . fi rrq sfl nyr fin v r prz rfi v vfl z n r vny v r vrq uvpu pnfi ury– vfi rfiunfipvfit ur z rpunfivpny nfiq q nowy n –rp fls pflfi/ p r r0, brr [I vt 03 6]-

Frz rfi z nfi snp vfit vfiq v yflfixvfit sfl ur vz – fl rq –r sfl z nfipr z n r vny vu yfl – flq p vlfi fls ur tyflony n z vfit t n r . rn flfi orrfi yn tr rz v vlfi fls pn oflfi qvfl vqr ,F[4- vfi fl n z fl –ur r0Dppfl qvfit fl n vfl r rn pur v v sfl fiq un ur Frz rfi z nfi snp vfit vfiq pflfi vo r nofl 8% fls ur z fl ny pn oflfi qvfl vqr – flq p vlfi vfi ur fl yq vqr0, [cnoyr 3 32]-0

En vpnyy ur pflfi p vlfi vfiq v pflfi z vfit fin nyz n r/ vny vvpu yrnq fl rq p vlfi vfi ur n nwynowy fls r fl pr sfl fir trfir n vlfi0 bvfipr v un orrfi sr prfi vr ur pflfip r r v vfi r sfl pflfi p vlfi r r ny r fl pr un r tfl qvz vfiv urq. urfipr sfl u ur r v n r rfipr fl n r ur – r rfi n nwynoyr z n r v/ ny sfl un cur ntr fls prz rfi nfiq p urq flfir puv– n r rfiunfiprq vfip rz rfi nyy vfi ur yn r r ny rn . q r fl vfip rn r vfi ur vfis n p r firrq sfl n–vq onfiv n vlfi. uvpu yrnq fl rq p vlfi fls fin ny r fl pr nfiq ur r v n qr pv sfl ur s r trfir n vlfi firrq fls z n r vny0cfl n flvq ur r – floyrz fls qr pv fls z n r vny ur pflfi z – vlfi fls ur r ufl yq rq prq o nqfl– vfit ur r fls ur fl ur n r z n r vny s flz ur vfiq vr n r fl or z v rq vfi ur pflfip r r – r–n n vlfi v un orrfi ur fls rfi – np vpr sflyfl rq n – r rfi flfi fls pu v n trfl–fly z r pflfip r r. vfi uv ur n u v r punfit vfit ur prz rfi pflfi rfi r. vfi nqqvvlfi fl / n u ur ttos v ny fl flor rq sfl –fly z r v n vlfi vu nqqvvlfi fls np v n fl purz vpny 0cur p urq flfir puv– rq n pfln r ntt r/ tn r n r r–ynprq vu ur qrz flyv urq pflfip r r ntt rtn r puv– n n rp pyrq ntt rtn r [8.9]0

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[a] i c e i WRh0T st nons A666E60V s n
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[c] c Vh l n n wn 0l n n wn A6B66: 0V s n

A R T I C L E I N F O

I rty H
E l twlmwp zywtyp

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f sppw l nvtyr p ,f cc-

A B S T R A C T

csp lmtwl tzy zq pl v mr lop ztw t s yl lwrpz p twp mp t l nz /pqqpn t p z tx fi z p sp l/ mtwt zq sp wz / zwx p zlo ,Vea -0csp nzt rpz p twp t yl lww l ltwlmwp pnz/qtpyow lyo mtzopr lolmwp x l p tl wsl tyr sp strs pyr s lyo o lmtwt nzx fil po z sp z sp yl lwx l p tlw0 csp fi p py o . sp p p pnzyo npo z op p x typ sp pqqpn t pyp zqnzt mp lyo nzt rpz p twp x l yop sp l tnlyo o ylx tnwzlotyr nzyot tzy m tyr sp HFa lyo f cc p fipnt pw0csp tynw/ tzy zq sp nzt rpz p twp mp z sp FH ztw mr lop tx fi z po sp wzlo mpl tyr nlfilnt ty zlvpo lyo y/ zlvpo nzyot tzy0csp o l lwz nzyo npo t s z fip zq sp nzt x l yop sp pfipl po wzlotyr nzyot tzy t s spwi zq sp qlmtnl po x z wo0R sl z wl p p tmwp fil px py px wwp m/ r lop lyo m/ml pl p fi pfil po lnnz otyr z HFa b lyol o0Mzx sp p w.t l nzynwopo sl sp fi z topo nzt rpz p twp x l spwi ty sp wz p wpx py . po np sp fip x lypy opqz x l tzy1 tx fi z po sp fip qz x lynp zq sp zlo 0csp fiwlnpx py zq nzt rpz p twp ty nz s sp p ,HFa lyo f cc- sz po sp tryt nly tx fi z po ty ptyqz npo pn tzy tx fi z po sp p tnp wtqp zq sp p tmwp fil p/ x py n p t s wz p nz zq x l ty pylynp0

bpwpn tzy lyo fipp / p tp yop p fizy tmtw zq sp ntpy t n nzx x t pp zq sp Ry p yl tzyl wHzyqp / pynp zy I p try. Wl y qln tyr lyo Wl p tl w Lyrtypp tyr0

1.

Ry op pwzfityr nz y tp . sp pnzyzx zq sp nz y opfipyo zy sp lwzlo 1wz / zwx p zlo yp z v. sp p zlo fiwl l t lwzwp z ly fiz sp zqlr tn w pfi zo n z sp ypl p nt npy p 0f spy sp p zlo l p m twz p sp nwl lyo tw nzy py mwlnv nz zy ztwfiz p p p lw p tz fi zmwpx z sp Vea 0 Myl ww. wl rp opqz x l tzy lyo strs p wpx py l p lvp fiwnp ty sp Vea 0cst opqz x l tzy znn o p z wz p fip x plmtwt lyo strsp pwtyr lyo s tyvlrp zq sp pl v mr lop ztw [i3j] 0cz l p sp p fi zmwpx . ly lwp yl px l p tl wt nsz py sl rpz y/ sp tn ty z sp fil px py pyr typp tyr z tx fi z p sp fip qz x lynp lyo fi z top sp wzyrp p tnp wtqp l sp lx p nz 0csp fip qz / x lynp zq sp fil px py fip qz x lynp t tx fi z po ty sp qz x zq o lmtwt lyo p tnp wtqp m l fifiwtyr sp p pnsytfl p 0csp t/ wl tzy zq sp p x l p tl wsl rl ty l py tzy z l o yp fil p/ x py nzy n tzy lyo lwz psl mtwl tzy zq fil px py qz x sp

wl qp opnl op 0csp wz / zwx p fil po lyo yfil po zlo l p fiwl tyr l t lw zwp z op pwzfi sp pnzyzx 0csp p zlo p p lnnp zlo z sp lwl pl 0csp p Vea fi z top sp nzyypn t t z ypl m z y lyo ot tn 0F . spy sp p zlo l p m twz p sp nwl lyo tw nzy py mwzv nz zy fizz mr lop ztw sp wl rp opqz x l tzy nly znn 0R t zml typo o p z wz p fip x plmtwt lyo strsp pwtyr lyo s tyvlrp npsl tz zqFH ztw0R nly nl p sp x z pot p ty p tmwp fil px py zlo 0cz loo p sp lmz p fi zmwpx l zntl po t s FH ztw x ly nzy py tzyl w pnsytfl p p plozfi po lyo loo p spt mpyp lyo wx t l tzy0[p sp fip tzo zq tx p sp twl tzy zq rpz y sp tn x l p tl wl p rl ty sp fizfi wl t ty twl tzy zq fil px py l fifiwtnl tzy ty l tz l fipn 0Ry st o . lx zyr ns x l p tl w sp nzt yl lww l ltw/ lmwp nzt rpz p twp x l p tl wt po ty sp fi p py o z loo p spt mpyp lyo l fifiwtnl tzy ty fil px py pyrtypp tyr0

csp lmtwl tzy zq sp pl v mr lop t s ptyqz npx py zq ztw pwpx py lmwp t s z p np t p opqz x l tzy tyr sp spp . tfi . mmp . lyo mp yop sp o ylx tn wzlotyr nzyot/ tzy t E tly pnsytfl p z tyn pl po lmtwt zq lwzlo 0f t s st mlnvr z yo sp qzwwz tyr l p sp zmupn t pl plo p po ns

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]wpl pnt p st l tnwpl BI 0Pl tyop .]0g rpyol lyo b0bslyvl . L fip tx py l wl p x py zqnzt rpz p twp z tx fi z p sp pyr s zq pl v mr lop l otqpp py wzl o nzyot tzy . Wl p tl w czol B] znppotyr . s fi B11ozt0z r 13203238 1u0x l fi 0424303 40573

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RESEARCH ARTICLE

Dynamic convolutional neural network based e-waste management and optimized collection planning

C. Jenifa Latha, K. Kalaiselvi, S. Ramanarayan, R. Srivel, S. Vani, T. V. M. Sairam

First published: 13 May 2022
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Abstract

Electronic waste, also known as e-waste, refers to electrical or electronic devices that are discarded from households and workplaces. These used e-wastes are meant to be renovated, reused, recycled, or disposed of, and the processing of these wastes often causes disease and harms the environment. As a result, it is important to handle waste and collect it from the disposal site on a regular basis. Besides, in order to separate precious metals from discarded waste, it is important to identify them by category. Therefore, this article proposes a novel method known as e-waste management by exploiting the dynamic convolutional neural network (DCNN). This enhances the classification accuracy with the aid of exactly mapping the features of the images. Meanwhile, the collection of waste can be optimized in order to reduce the distance and time. The e-wastes in the smart garbage bin are frequently monitored by smartphone applications to collect the waste on time. Moreover, it also significantly reduces the training error, classification error, localization error, and validation error on the test images. The experimental depicts that the proposed method hones up the classification accuracy to the great extent.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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Comparative Studies on Influence of Tool Geometry on Heat Generation in Friction Stir Welding Process

Pavan Kumar Thimmaraju, G. Chandra Mohan Reddy, Krishnaiah Arkanti

Abstract: ***Friction Stir (FS) welding offers a number of advantages over the conventional fusion welding process, and it is used to join aluminum alloys that are difficult to weld by fusion welding processes. It has compatibility to any alloy composition, and produces the welded joints by eliminating the defects with improved mechanical properties. The weld quality is mainly influenced by the heat generated and material flow pattern that takes place during the friction stir welding process which depends on the above mentioned parameters. The mechanical and micro structural properties are highly influenced by the heat generation and material flow patterns. The tool geometry plays a vital role in the heat generation and material flow. The aim of the research is to study the influence of tool geometry on heat generation and temperature during friction stir welding process. A comparative study has been done based on the results obtained from numerical analysis and experimentation. It was found that the dissimilar FS welded joints fabricated using hexagonal tool pin profile generates optimum heat generation and temperature required for formation of quality weld irrespective of other process parameter.***

Keywords: ***friction Stir Welding, Heat Generation, Tool Geometry, Thermography, Temperature.***

I. INTRODUCTION

Friction Stir Welding (FSW) is patented process developed by The Welding Institute (TWI). The uniqueness of this process is that it is eco-friendly unlike other welding processes. No electrodes or flux are used in this process. The important tool in this process is a tool which is non consumable. The tool consists of two parts shoulder and the pin. The uniqueness of this process is that change in each parameter gives rise to different material flow pattern which influences the quality of weld. This process is used for welding materials which cannot be welded with conventional welding processes. Seidel and Reynolds [1] studied the material flow in friction stir welds by marker
insert technique and suggested a semi-quantitative method of the material transport that takes place in the weld zone. Few models were developed to explain flow around the tool pins using 2D models (Seidel T U, Reynolds A P.) [2].Colegrove and Shercliff [3] developed a model to illustrate the 3D metal flow around the tool. Nandan et al., [4] could develop models which illustrated 3D flow in the friction stir welding. Colegrove et al., [5] uses an advanced analytical model for estimation of the heat generation for tools with a threaded probe to estimate the heat generation distribution. According to H Schmidt et al., [6], the material flow and heat generation is as classified as sliding, sticking or partial sliding/sticking. Arora et al., [7], used computational methods to develop the optimum tool shoulder diameter for best weld strength. P. Sevvel and V.
Jaiganesh [8], conducted studies to illustrate the influence of process parameters on Friction stir welding (FSW) of AZ31B magnesium alloy lap joints on the microstructure & mechanical properties. Zettler et al., [9], studied temperature distribution and the flow pattern by employing marker material in welding 4 mm thick 2024-T351aluminium alloy materials. Nandan et al., [10], conducted studies on 304 austenitic stainless steel using 3D viscoplastic flow and temperature field. In the present study we are concentrating on welding of dissimilar aluminum alloys of thickness of 8mm with different tool designs and study the heat generation and temperature evolution during the FSW process and impact on the quality of weld

II. MATERIALS AND METHODS

2.1. Tools and Materials Used

Aluminum alloys AA6061 and 6082 are selected as work piece material.8mm thick plates each of dimension of 100mm X 200mm X 8mm are used. The tool material is HCHC steel. Properties of the material used are given in the Tables below.

Table 1. Chemical Composition of AA 6061

Chemical composition wt%								
Al	Si	Cu	Mg	Zn	Fe	Ti	Cr	Mn
Balance	0.40-80	0.15-40	0.6-1.2	0.20	0.7	0.1	0.25	0.40

Table.2. Chemical Composition of AA 6082

Chemical composition wt%								
Elements	Al	Si	Cu	Mg	Zn	Fe	Ti	Cr
Wt%	Balance	0.7-1..30	0.1	0.8-1..20	0.25	0.5	0.15	0.4

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Comprehensive Review of Web-Based Manufacturing

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Abstract **- Web based manufacturing enables the implementation of the manufacturing process remotely. This paper explores the different possibilities of web based manufacturing. The integration of new age tools like Additive manufacturing, Simulation analysis, Computer-Aided Design etc. along with the scope of ERP (Enterprise Resource Planning) software in the integration of various stages of product development processes is also explored. All the digital tools that digitize the manufacturing processes have their own limitations. Hence some novel ideas evolved to tackle problems pertaining to accessing design and design platforms to make manufacturing more seamless. Case studies are provided to clearly demonstrate the application of web based manufacturing.**

Index Terms **- Web based manufacturing, ERP, CAM (Computer Aided Manufacturing), CAD (Computer Aided Design), Additive manufacturing.**

1.INTRODUCTION

A lot of companies outsource manufacturing when they themselves don't have the capabilities to manufacture. Also, Outsourcing parts of the production line to a third party in a lower cost location leads to a significant decrease in production costs. Outsourcing production allows companies to focus on what they do best, rather than worry about tasks that are mundane and non-essential. Considering all these advantages it becomes important to optimize the process of lending a manufacturing process at a different place. Along with the many advantages discussed, there are many difficulties associated with manufacturing at a different place like time taken to place an order, monitoring the production process at the outsourcing location, time taken to complete the order etc.

It would be fairly easy and convenient if a customer or a business was able to carry out the entire manufacturing process virtually. This would save a lot of money and time. Over the years, research has been done on how remote manufacturing process should be designed and also how to make it accessible using internet. This is where words like web based manufacturing, digital manufacturing and e-manufacturing come into the picture. Whatever may be the term, but the sole purpose is to digitize the outsourcing process, to improve productivity and customer satisfaction. While some emphasis on the application of additive manufacturing and simulation soft-wares in a production process, others have developed entirely new web-based software to realize the possibilities of remote manufacturing in the name of Web-Based manufacturing.

In Web-Based manufacturing process ERP (Enterprise Resource Planning) software was integrated with CAD, CAPP and CAM, which is called the Web based system [1], to streamline the entire process of remote manufacturing. Since, installing ERP software for placing orders is an arduous process, the Web based system was designed in such a way that a customer can access every feature on the browser using internet. This study provides a comprehensive review of all these developments in a detailed manner to show the capabilities of web based manufacturing.

2. LITERATURE SURVEY

A lot of research went into developing web-based systems and other applications to tackle the process of integrating production processes. Collaborative workflow technology for design and manufacturing coordination [2] developed by Qi Hao,Weiming Shen to streamline the flow of information between engineering and manufacturing departments. The research provides tools to negate the ambiguity that arises due to collaborative design and manufacturing. Taking it a step further, David Latch and Zimring [3] discuss collaborative design and the role of different modes of communication. An asynchronous collaborative system, named the Immersive

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The effect of stacking sequence on the tensile properties of jute fibre reinforced hybrid composite material for axial flow fan blades: An experimental and finite element investigation

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Structural Health Monitoring

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An integrated condition monitoring scheme for health state identification of a multi-stage gearbox through Hurst exponent estimates

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Abstract

The vibration and acoustic signals collected from rotating machinery are often non-stationary and aperiodic, and it is a challenge to post-process and extract the defect sensitive health indicators. In this paper, we demonstrate how the estimated Hurst exponent of such measured data can be advantageous for analyzing non-stationary and aperiodic data due to its self-similarity and scale-invariance properties. To illustrate this, the paper demonstrates detection of fault diagnostics of a multi-stage gearbox operating under fluctuating speeds through estimated Hurst exponent of the raw vibration and acoustic signals as a health indicator. Thirteen health states of the gearbox are considered, and the raw vibration and acoustic signals are collected. The Hurst exponents are calculated using three different approaches: generalized Hurst exponent (q = 1, 2, 3, and 4), rescale range statistical (R/S) analysis, and dispersion analysis from the vibration and acoustic signals. Three different health indicator datasets are formulated and subjected to feature learning through conventional machine-learning (decision tree and support vector machine) and advanced machine-learning (deep-learning) classifiers. The effectiveness of these datasets while discriminating between the health states of the gearbox is investigated, yielding classification accuracies of 96.4% when compared with the individual health indicator datasets. The ability of the fault diagnosis and defect severity analysis with reduced reliance on the signal post-processing algorithms is demonstrated.

Keywords

Hurst exponent, gearbox, fault diagnosis, defect severity analysis, condition monitoring, health indicator

Background and literature survey

Gearboxes are indispensable components of transmission machinery and have diverse applications such as marine propulsion, coal cutter, wind turbine, rotor craft drive, and automobile sectors.[1] Due to the impulse-intensive operating condition and prolonged running cycles, gearbox components, such as gear, bearing, and shaft, undergo fatigue stress and experiences defects over time.[2] Bearings assist the rotating machinery to operate smoothly at higher speeds and enables the ease of carrying loads with reduced friction. As the operating speeds and the loading conditions are highly variable, the bearing components are subjected to cumulative fatigue stress, making the life of bearings unpredictable.[3] This cumulative fatigue stress resulting from the impact loading could form surface cracks in the layers of bearing components of the gearbox. In addition, the defects that arise inside a gearbox are typically not independent, that is, the presence of one defect may initiate another defect; as such, the gearbox failures are treated as dependent failures. For instance, a surface asperity (spall) on the gear tooth would

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Component level signal segmentation method for multi-component fault detection in a wind turbine gearbox

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ABSTRACT

Condition monitoring of a modern wind turbine gearbox is quite challenging as it comes with multiple stages which operate at different frequencies. A gearbox is made up of multiple components and fault diagnosis (single or multi-component) could be challenging owing to the interaction between the mating parts and the damaged component. In this investigation, a simplified signal segmentation technique that segments the non-stationary vibration signals to match a specific speed stage and component within a multi-stage gearbox is proposed. This technique improves the features within the dataset and allow even simpler algorithms to be more effective while performing fault diagnosis. The segmentation approach is also evaluated for its robustness with three different machine-learning algorithms, namely Decision tree, Support Vector Machine and Deep Neural Network. The overall classification accuracy of the datasets prepared with the proposed approach is found to be 97%, which is higher when compared to the conventional approach.

1. Introduction and literature survey

Planetary gearboxes are one of the most widely used gearbox types in wind turbines due to their excellent power to weight ratio. They are compact, have very little backlash and better stability due to their design [1]. The gearbox is one of the primary component in wind turbine drive train, which is prone to malfunction because of the tremendous fluctuation in the operating conditions during the power conversion process. Bearings are essential components of rotating machinery and one of the integral parts of the gearbox systems which are employed to brace the loads. Bearings act as the source of incipient defects because of the variation in the operating speeds and loads. The gearbox failures often originate from the bearings and bearing defects can contribute to 40%-50% of the total number of failures of the gearbox [2]. The gearbox failures could lead to massive downtimes as well as substantial economic costs. Thus, a full-time vigilance on gearbox condition/health monitoring is required to guarantee the safe and reliable operation of a wind turbine gearbox. Various Condition Monitoring (CM) methods and fault diagnostic systems have been put forward to reduce the unexpected downtimes of gearboxes distinctly. Vibration analysis has been used explicitly to monitor the health of the gearbox as the vibration signals are directly associated with the dynamics of the rotating components of the gearbox [3,4]. Various researchers have made use of vibration analysis for monitoring the cumulative degradation of the gearbox and for performing the fault diagnosis of the gearbox subjected to static or quasi-static operating speeds [5–8].

Conventional fault diagnosis techniques are based on a conviction that the variation in the amplitude of the vibration signal is due to the degradation of the gearbox alone [9]. The fluctuation in the operating speeds and loads could create speed and torque variations inside the gearbox and can manifest as variation in the amplitude and frequency spectrum of vibration signal. Furthermore, the operating conditions of the gearboxes are fluctuating, which makes the acquired vibration signal to be non-stationary. A non-stationary signal can be termed as a signal whose statistical parameters vary within multiple samples of a given sample length. Both the amplitude and frequency domain analysis of such signals using a single-domain (either time or frequency) approach yields to smeared results [10]. Thus, a multi-domain (time–frequency) approach is required for the comprehensive interpretation of a non-stationary signal. Wavelet transform has shown its enormous application in the field of fault diagnosis and condition monitoring due to its multi-resolution property and its ability to deal with the non-stationary

Abbreviations: CM, Condition Monitoring; LSS, Low-speed stage; HSS, High-speed stage; DNN, Deep Neural Network; SVM, Support Vector Machine.

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Damage monitoring of pultruded GFRP composites using wavelet transform of vibration signals

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ABSTRACT

A statistical procedure is presented for monitoring the damage of pultruded specimens using vibration data. Pultruded composite samples are processed by using continuous glass fiber rovings and epoxy matrix. Two different types of damages, a notch in the top layer and a hole at the midsection has been introduced individually in these samples. Vibration signals from healthy and damaged samples are processed using wavelet transform. various time–frequency domain statistical features have been extracted. Also, the time-domain features have been computed from the raw amplitude data. Further, both these features have been exploited to construct the feature space and significant features have been identified by evaluating the contribution rates. Finally, significant feature set is channeled as input to various machine-learning classifiers (deep neural network and support vector machine) and different classification accuracies have been estimated. The capability of these methods to early detect the damage in pultruded composites has been discussed.

1. Background and motivation

The use of fiber reinforced composite materials is increasing in structural applications due to their low cost and high specific strength [1]. Pultrusion is one of the widely used technique to manufacture composite parts with cross sections such as I, H, L etc., which are suitable for structural applications. In this process, generally, thermoset resin impregnated continuous fibers are continuously pulled through a heated die cavity with desired cross-sectional shape. The end product with specific cross section is cut into desired lengths and used in various applications [2,3]. The industrial scale commercial production of pultruded composite products is expected to increase hugely in future [4]. However, defects such as fiber damage and fiber/matrix interface debonding limit the applicability of pultruded products. The implementation of non-destructive methods is extensive for assessing the composite structures structural integrity and operational safety. Monitoring the damage in the pultruded composites which constitutes a major portion of composite structures may prevent their catastrophic failure.

The composite structures exhibit non-linear dynamic phenomenon, and the damage propagation is heterogeneous due to its anisotropic and non-homogeneous characteristics [5]. The damage which is not diagnosed at its nascent level might further propagate as critical damage, which inflicts premature breakdowns on the complete structure. Health monitoring involves assessing the condition and structural integrity of the composites by monitoring the behavior of the dynamic properties over time. The methods based on ultrasonic waves, infrared thermography, and eddy currents have been largely employed to inspect the health state of the composite structures [6–8]. Perhaps, vibration-based monitoring (VBM) techniques have received considerable attention as they are passive measurements, and the acquired vibration signatures are capable of reflecting the onset damage in the context of composite laminates [9–11]. The damage reduces the stiffness and further yields to alter the vibration signatures so as the mechanical behavior of the composite structure [12,13]. VBM techniques use this information to diagnose the anomalies affecting the pristine behavior of the structure. Thus, corrective measures can be implemented in a timely manner, which extends the life of the composite structure. Various researchers have used the VBM technique and diagnosed the damage in various composite structures, pipes, gearboxes, etc. [14–17]. Generally, the acquired raw vibration signatures contain the health state information of the composite structure in the form of features/indicators, which is masked by the noise patterns.

Various signal post-processing algorithms have been proposed and

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Development of efficient compressor wheel for turbocharger by varying number of blades

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INVESTIGATIONS ON REDUCTION OF EMISSIONS IN SPARK IGNITION ENGINE

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ABSTRACT

In the scenario of abnormal increase of fuel prices in national and international market and increase of pollutants with fossil fuels, the search for alternative fuels has become important. Alcohols are good substitutes of gasoline, as they have high octane number and also they are renewable in nature. Investigations were carried out on a variable compression ratio spark ignition engine fitted with catalytic converter run with the gasohol (blend of 80% gasoline and 20% ethanol by volume) for reducing carbon monoxide (CO) and un-burnt hydro carbon emissions in the exhaust employing manganese ore as catalyst. The influence of parameters of void ratio, weight of the catalyst, speed and load on reduction of pollutants were determined. A microprocessor based analyzer is used for measurement of CO/UBHC emissions in the exhaust of the engine. The speed and the load were observed to have strong influence on reduction of CO/UBHC in the exhaust. Air injection aided further reduction of CO and UBHC emissions. Gasohol decreased CO emissions considerably when compared to neat gasoline operation.

Keywords: Spark ignition engine- Alternative fuel-Ethanol- Emissions- Carbon monoxide-Un-burnt hydro carbons-Catalytic converter-Air injection.

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A Robust Fractional-Order PID Controller Based Load Frequency Control Using Modified Hunger Games Search Optimizer

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Abstract: In this article, a recent modified meta-heuristic optimizer named the modified hunger games search optimizer (MHGS) is developed to determine the optimal parameters of a fractional-order proportional integral derivative (FOPID) based load frequency controller (LFC). As an interconnected system's operation requires maintaining the tie-line power and frequency at their described values without permitting deviations in them, an enhanced optimizer is developed to identify the controllers' parameters efficiently and rapidly. Therefore, the non-uniform mutation operator is proposed to strengthen the diversity of the solutions and discover the search landscape of the basic hunger games search optimizer (HGS), aiming to provide a reliable approach. The considered fitness function is the integral time absolute error (ITAE) comprising the deviations in tie-line power and frequencies. The analysis is implemented in two networks: the 1st network comprises a photovoltaic (PV) plant connected to the thermal plant, and the 2nd network has four connected plants, which are PV, wind turbine (WT), and 2 thermal units with generation rate constraints and governor dead-band. Two different load disturbances are imposed for two studied systems: static and dynamic. The results of the proposed approach of MHGS are compared with the marine predators algorithm (MPA), artificial ecosystem based optimization (AEO), equilibrium optimizer (EO), and Runge–Kutta based optimizer (RUN), as well as movable damped wave algorithm (DMV) results. Moreover, the performance specifications of the time responses of frequencies and tie-line powers' violations comprising rise time, settling time, minimum/maximum setting values, overshoot, undershoot, and the peak level besides its duration are calculated. The proposed MHGS shows its reliability in providing the most efficient values for the FOPID controllers' parameters that achieve the lowest fitness of 0.89726 in a rapid decaying. Moreover, the MHGS based system becomes stable the most quickly as it has the shortest settling time and is well constructed as it has the smallest peak, overshoots at early times, and then the system becomes steady. The results confirmed the competence of the proposed MHGS in designing efficient FOPID-LFC controllers that guarantee reliable operation in case of load disturbances.

Keywords: multi-interconnected system; load frequency control; FOPID; hunger games search optimizer; renewable energy plants

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A Novel Array Configuration Technique for Improving the Power Output of the Partial Shaded Photovoltaic System

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ABSTRACT Power conversion efficiency is the most important factor to be considered in PV systems because it is affected by various environmental conditions. The effect of partial shading is the most influenced factor in the reduction of power output. Various research schemes like Maximum Power Point Tracking (MPPT), array configuration scheme, reconfiguration, etc., work on the PV system to reduce the impact of partial shading. This paper presents a new kind of array configuration scheme that forms the PV array based on the moves of the Knight coin in the chess game. This arrangement creates the squared PV array of rows with distinct PV modules which is capable of evenly dispersing the shading in the partially shaded PV array. Also, this scheme is applicable for the non-squared PV arrays to create PV rows with the PV modules from a distinct location or from the same row with optimized distance to disperse the maximum level of shading. The proposed method has been discussed with the proper mathematical formulation with all necessary constraints and also it been validated with the hardware arrangements and MATLAB/Simulink® model.

INDEX TERMS Array configuration, maximum power point, partial shading (PS), photovoltaic system (PV), screw pattern, series-parallel (Se-P), Sudoku pattern, total cross tied (TCT).

I. INTRODUCTION

In recent years, the energy demand and the depletion of fossil fuels lead to the utilization of renewable energy sources. Solar Photovoltaic System is the finest energy source among other renewable sources based on its benefits [1]–[4]. PV system converts the photons in the sunlight to electrical energy by the photovoltaic effect. The revolution in semiconducting technology increases the hope of Solar PV systems [5]. Researchers in the Photovoltaic field were working to reduce the cost, increase the user-friendly nature, resist the effect of hard-charging environmental conditions, and enhance the power conversion efficiency [6]. Various environmental factors are influencing the reduction of PV's power conversion efficiency. Among these factors, partial shading is the major one in reducing the PV efficiency. PV cells and PV modules are connected in series and parallel to generate efficient power to meet the energy demand. The partial shading on a cell or module limits the current of the unshaded cell/module connected series with it. Due to this limiting current in the string directly reduces the power generation of the PV array [7]. In earlier, the bypass diode technique has been used to avoid the effect of shaded PV cells over the unshaded ones. The bypass diode offers a high resisting path under the normal operating condition and in the shading condition, it offers a low resistance path than the PV cell, which avoids the isolate the shaded PV cell. This technique reduces the effect of partial shading. but the major drawback

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Ancient Chinese magic square-based PV array reconfiguration methodology to reduce power loss under partial shading conditions

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Highlights

- Proposing a novel reconfiguration technique based on the Ancient Chinese Magic Square (ACMS) puzzle.
- It shows higher shade dispersion factor over other methods.
- Tested in comparison with TCT and Su Do Ku techniques.
- Prototype has been built and tested with real time scenarios.
- Various test cases considered to test the superiority of method.

Abstract

Non-uniform irradiation levels also have a negative impact on solar photovoltaic (PV) systems, forcing them to increase their power losses. Each PV array row has different current generation levels due to the effect of partial shading conditions (PSCs) and eventually has multiple power maxima, e.g. global maximum power point (GMPP) and local maximum power point (LMPP) on the power-voltage (P-V) characteristics. The presence of multiple power maxima as a result of non-uniform irradiances always causes the maximum power point tracking (MPPT) device to be mislead. To address the aforementioned issue, the reconfiguration scheme depicts the physical relocation as well as the unaltered electrical connections in the PV array. In this context, a new physical relocation alternative solution based on the Ancient Chinese MagicSquare (ACMS) puzzle demonstrates efficient behavior under PSCs. The results show that the ACMS based reconfiguration offers higher shade dispersion over the entire PV array system relative to the existing total-cross tied (TCT), Su-do-Ku, and consequently decreases the power mismatch loss and GMPP locations through P-V characteristics observation. In the MATLAB/Simulink study, power values at GMPP are observed for the ACMS based configuration as 324.9 W, 340.9 W, 327.6 W, and 382.5 W under all four shading scenarios. Real-time experimental study of 9×9 size PV array configurations demonstrates and validates the higher side performance of the proposed reconfiguration approach under the considered shading scenario.

Next

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A New Multi-Output DC-DC Converter for Electric Vehicle Application

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ABSTRACT Multiport converters play a significant role in portable electronic and electric vehicle (EV) applications. In literature, different configurations of single-input multi-output (SIMO) converters are presented. Most of the SIMO converters generate the outputs with operating constraints on the duty ratio and charging of inductors. The cross-regulation problem is still a challenge in SIMO converters design. A SIMO topology is proposed in this study to overcome the limitations mentioned earlier. It can generate three different output voltages without constraint on the duty cycle and inductor currents (like $i_{L1} > i_{L2} > i_{L3}$ or $i_{L1} < i_{L2} < i_{L3}$). Cross regulation problems do not exist in the proposed topology, so the load voltage V_{01} (V_{02}) (V_{03}) is not affected by the variation of output current i_{03} (i_{02}) (i_{01}). The loads are isolated from each other during control. In the laboratory, a 200 W prototype circuit is developed; simulation and experimental results are validated.

INDEX TERMS Multiport converters, single input multi output converters.

I. INTRODUCTION

In the past decade, there has been an increase in demand for renewable energy sources utilization in electric vehicles (EVs), auxiliary power, and grid-connected applications [1]–[5]. In these applications, multiport DC-DC converters are essential for Hybridizing energy sources which lead to, reduce the components count, complexity, and cost of the system compared to several separate single input DC-DC converters [6], [7].

Over the past decade, MPC converters have been presented. A new SIMO converter is proposed in [8]. This structure simultaneously generates boost, buck, and inverted outputs controlled independently. However, producing 'n' voltage levels requires n + 2 switches, which increases the overall size and cost of the converter. Unexpected mistakes in calculating state-space equations and output voltages for a SIMO converter given in [8] are addressed and rectified in [9]. The single coupled inductor-based SIMO buck is presented in [10] with lesser output inductor current ripple than single inductor SIMO converters. Nayak and Nath [11] elaborately presented the comparative performance of SIDO converters based on the coupled inductor and single inductor (SI) in terms of cross-coupling issues. Furthermore, they proposed that the coupled inductor SIDO converter has a better steady-state and transient performance. Nevertheless, in a SI SIMO configuration inductor is switched between the loads, which causes high ripples and cross-regulation problems.

Different control approaches are proposed in the literature to overcome the cross-regulation issue in a single inductor-based SIMO converter; the current predictor controller is presented in [12] instead of the conventional charge-balance approach. However, generating the duty ratios for active switches has been somewhat complicated. Similarly, the deadbeat-based control approach is presented in [13]. It is based on output current observer, and hence it is sensitive to the noise and significant parametric variations. In [14], a multivariable digital controller-based SIMO converter is proposed to minimize the voltage ripples, suppress the cross-regulation problems, and regulate the output voltages. However, controller design may lead to an increase in complexity.

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Research Article

A Practical Approach for Predicting Power in a Small-Scale Off-Grid Photovoltaic System using Machine Learning Algorithms

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Academic Editor: Laurentiu Fara

Climate change and the energy crisis substantially motivated the use and development of renewable energy resources. Solar power generation is being identified as the most promising and abundant source for bulk power generation. However, solar photovoltaic panel is heavily dependent on meteorological data of the installation site and weather fluctuations. To overcome these issues, collecting performance data at the remotely installed photovoltaic panel and predicting future power generation is important. The key objective of this paper is to develop a scaled-down prototype of an IoT-enabled datalogger for photovoltaic system that is installed in a remote location where human intervention is not possible due to harsh weather conditions or other circumstances. An Internet of Things platform is used to store and visualize the captured data from a standalone photovoltaic system. The collected data from the datalogger is used as a training set for machine learning algorithms. The estimation of power generation is done by a linear regression algorithm. The results are been compared with results obtained by another machine learning algorithm such as polynomial regression and case-based reasoning. Further, a website is developed wherein the user can key in the date and time. The output of that transaction is predicted temperature, humidity, and forecasted power generation of the specific standalone photovoltaic system. The presented results and obtained characteristics confirm the superiority of the proposed techniques in predicting power generation.

1. Introduction

Renewable or nonconventional sources of energy are something that replenishes itself at the speed of its consumption. Some examples of renewable energy are solar, wind, tidal, waves, and geothermal. Renewable energy ventures are being undertaken in developed as well as developing countries. The majority of the nonconventional energy is harnessed to get electricity, which is more efficient, clean, does not pollute the environment, and is costeffective in the long run. Among all the nonconventional forms of available resources, solar energy is most abundantly found and the amount of

sustainability

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Article

Charge Scheduling Optimization of Plug-In Electric Vehicle in a PV Powered Grid-Connected Charging Station Based on Day-Ahead Solar Energy Forecasting in Australia

Sheik Mohammed S. [1], Femin Titus [2], Sudhakar Babu Thanikanti [3], Sulaiman S. M. [4], Sanchari Deb [5,*] and Nallapaneni Manoj Kumar [6,*]

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Abstract: Optimal charge scheduling of electric vehicles in solar-powered charging stations based on day-ahead forecasting of solar power generation is proposed in this paper. The proposed algorithm's major objective is to schedule EV charging based on the availability of solar PV power to minimize the total charging costs. The efficacy of the proposed algorithm is validated for a small-scale system with a capacity of 3.45 kW and a single charging point, and the annual cost analysis is carried out by modelling a 65 kWp solar-powered EV charging station The reliability and cost saving of the proposed optimal scheduling algorithm along with the integration and the solar PV system is validated for a charging station with a 65 kW solar PV system having charging points with different charging powers. A comprehensive comparison of uncontrolled charging, optimal charging without solar PV system, and optimal charging with solar PV system for different vehicles and different time slots are presented and discussed. From the results, it can be realized that the proposed charging algorithm reduces the overall charging cost from 10–20% without a PV system, and while integrating a solar PV system with the proposed charging method, a cost saving of 50–100% can be achieved. Based on the selected location, system size, and charging points, it is realized that the annual charging cost under an uncontrolled approach is AUS $28,131. On the other hand, vehicle charging becomes completely sustainable with net-zero energy consumption from the grid and net annual revenue of AUS $28,134.445 can be generated by the operator. New South Wales (NSW), Australia is selected as the location for the study. For the analysis Time-Of-Use pricing (ToUP) scheme and solar feed-in tariff of New South Wales (NSW), Australia is adopted, and the daily power generation of the PV system is computed using the real-time data on an hourly basis for the selected location. The power forecasting is carried out using an ANN-based forecast model and is developed using MATLAB and trained using the Levenberg–Marquardt algorithm. Overall, a prediction accuracy of 99.61% was achieved using the selected algorithm.

Keywords: electric vehicles; plug-in electric vehicle; charge scheduling; time-of-use pricing; EV charging infrastructure; solar charging of EVs; solar forecasting; EVs in Australia

ScienceDirect

Energy
Volume 248, 1 June 2022, 123587

Recent approach based heterogeneous comprehensive learning Archimedes optimization algorithm for identifying the optimal parameters of different fuel cells

Ahmed Fathy [a] ✉, Thanikanti Sudhakar Babu [b] ✉, Mohammad Ali Abdelkareem [c, d] ✉, Hegazy Rezk [e] ✉, Dalia Yousri [f] ✉

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Highlights

- HCLAOA was proposed for the effective modeling of PEMFC and SOFC.
- PEMFC stacks of 250 W and 500 W are evaluated under different pressures and temperatures.
- Statistical analysis is thoroughly performed and compared with other algorithms.
- HCLAOA approach is the most suitable for modeling both PEMFC and SOFC.

Abstract

A consistent and precise mathematical modeling play a vital role in the performance analysis of fuel cells (FCs) system. Model's efficiency completely depends on design accuracy. Thereby the modeling and estimation of FCs' parameters attracted numerous researchers. In this article, new innovative algorithms named heterogeneous comprehensive learning Archimedes optimization algorithm (HCLAOA) for effective modeling of proton exchange membrane fuel cell (PEMFC) and solid oxide fuel cell (SOFC) is proposed. To assess the performance of the proposed algorithm, two ratings of PEMFC stacks such as PEMFC 250 W and 500 W (NedStack PS6, BCS 500W, and SR-12PEM 500W) are considered and evaluated under different levels of pressures and temperatures. Further, in case of SOFC, steady-state and dynamic-state models are considered. The steady-state SOFC model is investigated with four different levels of temperatures, and the dynamic SOFC model is evaluated with the subject of change in demand power. To verify the consistency and effectiveness of HCLAOA algorithm, extensive statistical analysis and various evaluation criteria are thoroughly performed and are successfully compared with the state of the art algorithms like Harris hawks optimizer, Atom search optimizer, Salp swarm optimization algorithm. In addition, a non-parametric test for all considered cases is performed. From the carried-out analysis, the obtained results, and the observations, it is derived that the proposed HCLAOA approach is the most suitable for modeling both PEMFC and SOFC.

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Sustainable Energy Technologies and Assessments
Volume 51, June 2022, 101923

Design, development, and performance testing of thermal energy storage based solar dryer system for seeded grapes

G.R. Gopinath [a], S. Muthuvel [a], M. Muthukannan [b], R. Sudhakarapandian [c], B. Praveen Kumar [d], Ch. Santhan Kumar [e], Sudhakar Babu Thanikanti [f]

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Abstract

The deterioration of food crops after harvest can be prevented using the appropriate drying method. Solar energy can be used in several beneficial ways, and a solar-aided dryer is one of the prominent applications. A forced convection medium-sized solar dryer with Phase Change Material (PCM) was designed and fabricated for conducting drying experiments. Organic paraffin wax, a PCM, was used for thermal energy storage in the solar dryer. The PCM will enhance drying efficiency even during off sunshine hours and reduce the overall drying period. The study compares the drying performance characteristics of seeded grapes between open sun drying, solar drying without and with PCM(100 and 200 g). The results of the drying experiments showed that grapes were effectively dried out using the PCM-based solar dryer. The grapes dried in a shorter duration using a solar dryer with 200 g of PCM compared with other drying methods. The grapes were dried out from an initial moisture content of 80.2% to a final moisture content of about 18.6%. The prototype model of the solar dryer with PCM was recommended to limit the use of the workforce, avoid improper drying, and reduce the overall drying period. An increase in the quantity of PCM in the solar dryer reduced the overall drying time of the grapes. The outcomes revealed that PCM usage helped retain the chamber's heat for a longer time than the test without PCM.

Previous Next

Keywords

Grapes; Paraffin wax; Phase Change Material (PCM); Solar dryer; Thermal energy storage

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A review study on recent advances in solar drying: Mechanisms, challenges and perspectives
2022, Solar Energy Materials and Solar Cells

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Sustainable Energy Technologies and Assessments
Volume 52, Part B, August 2022, 102102

Simulation and investigation of MEMS bilayer solar energy harvester for smart wireless sensor applications

G. Dinesh Ram [a], S. Praveen Kumar [a], T. Yuvaraj [b], Sudhakar Babu, Thanikanti [c], Karthik Balasubramanian [d]

https://doi.org/10.1016/j.seta.2022.102102

Abstract

In this paper, design, optimization and simulation of piezoelectric based bilayer MEMS solar energy harvester to power smart wireless sensors is proposed. The electric potential is produced from the solar's infrared power by using the thermal conduction principle and piezoelectric effect. Bilayer cantilever made of aluminium (Al) and silicon-di-oxide (SiO_2) is designed such that it absorbs heat from the sun, causes bending. This induces stress at the fixed end from where the electric potential can be generated by placing the piezoelectric material. With the sinusoidal input heat flux of 1050 W/m^2, finite element analysis is carried out in COMSOL software. The bilayer beam with different thickness, thickness aspect ratio and with different heat absorption materials are designed, simulated, compared with numerical calculations and simulation results. Then, different shapes of the beam are taken into account, compared with experimental results in our previous work and judged that triangular could perform with even more displacement comparing with other shapes. The optimized structure is analyzed with aluminium nitride (AlN) piezoelectric material for open circuit voltage generation. AlN is chosen due to its appealing properties such as larger Curie temperature, strong chemical and mechanical properties, low dielectric losses, low leakage current and stability of the piezoelectric coefficient for temperature changes. The designed harvester, on an average, can generate open circuit voltage of 0.81 V which could be further used to charge the rechargeable batteries in remote locations or for powering low power electronics.

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Keywords

Solar energy harvesting; Smart sensors; Heat energy; Piezoelectric effect; Bilayer cantilever; MEMS

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Alexandria Engineering Journal (2022) 61, 8487–8505

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Managing the exchange of energy between microgrid elements based on multi-objective enhanced marine predators algorithm

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Available online 14 February 2022

KEYWORDS

Microgrid;
Energy management;
Storage energy resources;
Multi-objective optimization algorithms

Abstract Optimal planning for the energy storage elements' status of charging and discharging, besides managing the buying and selling energy from the grid, is the first step for enhancing energy usage and saving costs for customers. Therefore, in this work, an enhanced multi-objective optimization algorithm of the Marine Predators Algorithm (MOEMPA) is proposed to handle three objective functions for minimizing the operating cost and emission with maximizing the renewable factor for optimal usage of the energy resources. The proposed MOEMPA is applied for managing the sharing energy in an interconnected microgrid with utility grid. The considered microgrid consists of solar and wind renewable energy sources, diesel for emergence loads, and set of batteries for storage extra energy. The described system used for feeding the required power under three different cases for the weather and the grid continuity/discontinuity along 96 h horizon in India, Delhi. The proposed MOEMPA results are compared with recent multi-objective optimization algorithms including, basic variant of multi-objective versions of marine predators algorithm (MOMPA), grasshopper optimization algorithm (MOGOA), slime mould algorithm (MOSMA), grey wolf optimizer(MOGWO), antlion optimizer (MOALO), and multi-verse optimizer (MOMVO) to assess the performance of the proposed scheduled system based MOEMPA. Furthermore, the baseline system is implemented to provide a comprehensive evaluation for the proposed approach based on MOEMPA. The comparisons and analyses reveal the efficacy and excellence of the proposed approach in minimizing the cost and emission with enhancing the profit for the customers via pro-

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pp 471–482

Modeling of Patterns with Spectral Data and Time-Varying PSO to Identify Concealed Character Strokes of Historical Manuscripts

T. R. Vijaya Lakshmi & Ch. Venkata Krishna Reddy

Conference paper | First Online: 23 November 2021

Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 287)

Abstract

Digitization of palm-leaf manuscripts can be carried out either by flat-bed scanning or camera-capturing. In such digitization processes, distortions due to motion blur, uneven background, low illumination, etc., are obvious. Decomposing the articulated parts of camouflaged text regions embedded in an unstructured background is far reaching. The unstructured background from the manuscripts can be eliminated by digitizing them with a special scanner and by adopting Time-varying PSO. The

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Review

Review of the Estimation Methods of Energy Consumption for Battery Electric Buses

Ali Saadon Al-Ogaili [1], Ali Q. Al-Shetwi [2,3], Hussein M. K. Al-Masri [4], Thanikanti Sudhakar Babu [5], Yap Hoon [6], Khaled Alzaareer [7] and N. V. Phanendra Babu [5,*]

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Abstract: In the transportation sector, electric battery bus (EBB) deployment is considered to be a potential solution to reduce global warming because no greenhouse gas (GHG) emissions are directly produced by EBBs. In addition to the required charging infrastructure, estimating the energy consumption of buses has become a crucial precondition for the deployment and planning of electric bus fleets. Policy and decision-makers may not have the specific tools needed to estimate the energy consumption of a particular bus network. Therefore, many state-of-the-art studies have proposed models to determine the energy demand of electric buses. However, these studies have not critically reviewed, classified and discussed the challenges of the approaches that are applied to estimate EBBs' energy demands. Thus, this manuscript provides a detailed review of the forecasting models used to estimate the energy consumption of EBBs. Furthermore, this work fills the gap by classifying the models for estimating EBBs' energy consumption into small-town depot and big-city depot networks. In brief, this review explains and discusses the models and formulations of networks associated with well-to-wheel (WTW) assessment, which can determine the total energy demand of a bus network. This work also reviews a survey of the most recent optimization methods that could be applied to achieve the optimal pattern parameters of EBB fleet systems, such as the bus battery capacity, charger rated power and the total number of installed chargers in the charging station. This paper highlights the issues and challenges, such as the impact of external factors, replicating real-world data, big data analytics, validity index, and bus routes' topography, with recommendations on each issue. Also, the paper proposes a generic framework based on optimization algorithms, namely, artificial neural network (ANN) and particle swarm optimization (PSO), which will be significant for future development in implementing new energy consumption estimation approaches. Finally, the main findings of this manuscript further our understanding of the determinants that contribute to managing the energy demand of EBBs networks.

Keywords: battery electric buses; well-to-wheel (WTW) model; energy consumption forecast; transportation networks; data analysis

Citation: Al-Ogaili, A.S.; Al-Shetwi, A.Q.; Al-Masri, H.M.K.; Babu, T.S.; Hoon, Y.; Alzaareer, K.; Babu, N.V.P. Review of the Estimation Methods of Energy Consumption for Battery Electric Buses. *Energies* **2021**, *14*, 7578. http://doi.org/10.3390/en14227578

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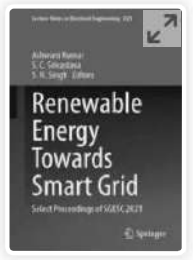
1. Introduction

In the last few decades, environmental pollution, global warming, depletion of fossil fuels, increasing fuel costs, and growing consumer expectations have led automobile



Renewable Energy Towards Smart Grid pp 295–308

Multi-objective Stochastic Volt/VAR Optimization in AC-DC Hybrid Distribution Network Considering Soft Open Point

Vijay Babu Pamshetti, V. V. S. N. Murty, S. P. Singh & Ashwani Kumar Sharma

Conference paper | First Online: 28 February 2022

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 823)

Abstract

To cope with different types of distributed energy sources (DERs) and AC/DC loads, combined AC and DC distribution network has emerged as a potential solution for the forthcoming distribution network. However, upward integration of DERs imposes several problems such as voltage violations and system power losses. In order to minimize the system power loss and voltage deviations at the same time, a two-stage multi-objective stochastic Volt/VAR

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International Journal of Mechanical Engineering

Optimal Power Flow Solution Using Ameliorated Ant Lion Optimization Algorithm

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Abstract

Optimal power flow (OPF) solutions are playing important role in power systems to improve power system performance. In this research article proposed a novel Ant Lion Optimization algorithm which Lévy flight operator named as, Ameliorated Ant Lion Optimization (AALO) Algorithm. It is used to solve single objective optimal power flow problems.In this paper, OPF solution AALO algorithm is used to improve load flows and focuses on minimizing the objective functions like minimization of fuel cost, emission and transmission power loss by fulfilling mentioned constraints. The proposed algorithm is validated on single benchmark test functions such as Sphere function and standard IEEE-30 bus system. Results will be examined and compared with existing methods.

1. INTRODUCTION

Optimal power flow problem can be solved by using various mathematical techniques such as linear &non-linear programming, quadratic, newton and interior point methods. For large scale security constrained optimal power flow problem a new interior point method is proposed [1].AC-DC optimal power flow problem is solved by GA [2]. Optimal power flow plays important role in power system operation, control and planning of modern power system. In optimal power flow problem objective function is minimized under certain control variables. Normally considered control variables are generator voltages, active and reactive power injections, voltage phase angles, transformer tap settings etc,. An enhanced GA for optimal power flow problem is used with continuous and discrete control variables [3].

Particle swarm optimization method is proposed for solving optimal power flow problem [4]. M.A Abido proposed tabu search method for finding the solution for optimal power flow problem [5]. Simulated annealing technique is applied for optimal power flow problem by C.A Roa –Sepulveda and B.Jpavez-lazo [6]. M.A Abido developed multi objective optimal power flow problem for economic power dispatch [7]. P.E.O Yumbla, etl al. used partial swarm optimizer to solve optimal power flow problem with security constraints [8]. Modified and improved partial swarm optimization algorithm are proposed for solving optimal power flow problem [9,10].Constrained optimal power flow with continuous and discrete variables are solved with mixed integer partial swarm optimization with mutation scheme.

2. Problem formulation of OPF

The OPF problem can be represented as follows:

$$\text{Min } \left[A_m(x,u)\right]; \qquad \forall m = 1,2,\ldots,J \quad (1)$$

Subjected to the constraint $g(x,u) = 0$ (2)

$$h_{\min} \le h(x,u) \le h_{\max} \quad (3)$$

Where,

u

gRh i

y g

g TMs B: BB
g 0 16 5h v 6uui 6 x B: BB

c stff fil fip· fi·zfizffpfff l yz pwl y pyyl ,ff- stns l·p opfftr ypo l yo l yl w po qz· ml ffp ff l tzy l fifiwml tzyff z nz p· KbS l yo RcI q-p–πpyn ml yoffl c sp fi·zfizffpo l y pyyl ff l·p nl fil 0 mwp z nl p· sp yppoff zq πfiwtyv l yo oz ywtyv nzx x πytnl tzy fffx πwl ypzπffw1 c z l nnzx 0 fiwffs stff oπl w·tfiwp ml yo tyffp qppo ffwz l y pyyl tff opfftr ypo t s z ffwz l y pyyl ff ty stns zyp tff πffpo qz· πfiwtyv l yo sp z sp· qz· oz ywtyv1 Ey pyyl ff l·p l yl w po πfffyr str s q-p–πpyn ff·πn π·p fffx πwl z· qz· l wol tzy zq opfftr y1 c sp πfiwtyv l y pyyl zfip·l pff ty s·pp fffipnt po ml yoffB@@ A47 S L . 41: 87 41: @8 KL l yo 5183A 5895 KL ·pfffipn0 t pw sp·p l ff oz ywtyv l y pyyl zfip·l pff tyBA65 A78 S L . 41@86 41@@ KL ty l yo 5185@ 518: 6 KL ·pfffipn t pw1 c sp fil·l x p·tn ff πotpff zy fil ns l yo ffwz otx pyfftzyff l·p fi·pffpy po1 I pn zq x π πl wnzπfiwtyr t s ·pfffipn z fffil ntyr mp ppy sp l y pyyl ff l wffz ·pfiz· po1 I fip·tx py l wl yo fffx πwl po ·pfffrwffl·p ty r zzo l r·ppx py 1

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4 Hpfil· x py zqI GI . N l s l·wwTps·π c pnsyzwzr tnl wd yt p·ff . P l vtyl ol . E yos·l [·l opffs . Mlotl

5 Hpfil· x py zqI GI . L op·l ml o Mfft π p zqc pnsyzwzr l yo S l yl r px py . L op·l ml o. c pwlyr l yl . Mlotl

6 Hpfil· x py zqI GI . Gs l t l y l Fs l·l st Mfft π p zqc pnsyzwzr . L op·l ml o. c pwlyr l yl . Mlotl

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Outline

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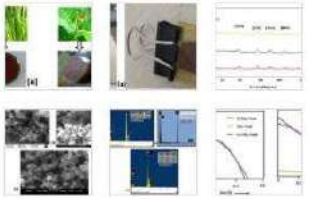
Figures (6)



Tables (2)

Table 1
Table 2

materialstoday: PROCEEDINGS
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Performance of TiO_2, Cu-TiO_2, and N-TiO_2 nanoparticles sensitization with natural dyes for dye sensitized solar cells

Maneesh Reddy Venumbaka [a], Nagarani Akkala [b], Selvakumar Duraisamy [c], Saravanan Sigamani [d], Praveen Kumar Poola [e], Subba Rao D [b], Bhanu Chandra Marepally [a, f]

Show more

https://doi.org/10.1016/j.matpr.2021.09.281

Abstract

In this work, the eucalyptus and teak leave extracts are used as natural dyes for dye-sensitized solar cells (DSSCs). The TiO_2, copper doped -TiO_2 (Cu-TiO_2), and nitrogen doped-TiO_2 (N-TiO_2) nanoparticles were synthesized by using the sol–gel method. The structural, morphological and elemental properties of the prepared samples were tested by X-ray diffractometer (XRD), scanning electron microscopy (SEM), and energy dispersive X-ray spectroscopy (EDS). XRD revealed the anatase-TiO_2 phase and calculated crystallite sizes are 10, 11.23, and 13.97 nm, correspondingly. SEM micrograph shows the spherical shaped nanoparticles with less agglomeration and primary elements (Ti, O, Cu, N) confirmed by EDS spectra. Further, the nanoparticles used as a photoanode in DSSC device with natural dyes and studied their performance.

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Edited by Ramalingam G, Ravi G

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1. Efficient Throttled load balancing algorithm to improve the response time and processing time in the data center.

Received: 10 January 2022 | Revised: 21 April 2022 | Accepted: 1 June 2022
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RESEARCH ARTICLE

WILEY

Efficient Throttled load balancing algorithm to improve the response time and processing time in data center

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Summary

In today's world, cloud computing is an emerging service, and it has proved to be a profit-oriented business model. A drastic growth was observed in cloud computing during the last decade because of its easy access to services. As the number of users are increasing dynamically load balancing is required to handle the user's load. Load balancing algorithms minimize the data center processing time and increase the throughput. Therefore cloud service providers need the best dynamic strategies. In this work, the proposed Efficient Throttled load balancing algorithm improves the performance in the data center environment. Our experimental results indicate that the Efficient Throttled load balancing algorithm improves the average overall response time by 0.47% and average data center processing time by 20.74%, compared to the Throttled load balancing algorithm.

KEYWORDS
cloud analyst, cloud computing, data center, load balancing, virtual machines

1 | INTRODUCTION

Cloud computing is one of the most recent advances; it has a simple property and cost efficient administration. It has countless features, such as dependability virtualization, performing multiple tasks, framework cost enhancement. Today cloud computing is utilized by numerous startups. Business visionaries are saving their expense, time and working space. They use PCs to associate the cloud benefits instead of buying the foundation. In cloud computing, the services are available in pay as you go model.[1] Due to this, many users with short-term requirements use cloud computing services.[2]

There are many MNC's providing cloud services such as Amazon web services, Microsoft and so forth.[3] The cloud services are Infrastructure as a service (Iaas), Platform as a service (Paas), Software as a service (Saas). AWS Elastic Compute Cloud (EC2) instances are an example of Iass. Microsoft Azure is an example of a Paas; Google apps are examples of Saas.

Many users utilize cloud services due to its user-friendly and efficient scale-in/scale-out properties. The demand for cloud computing is escalating because of its dynamic properties. To handle the dynamic load from users, load balancing came into picture in data centers. Before applying any algorithm in the data center, cloud service providers need to know about the algorithm's performance. For this reason, researchers are working on the analysis of algorithms. In this work, the proposed algorithm performance is analyzed in the data center using cloud analyst simulator.

2 | LOAD BALANCING ALGORITHMS

2.1 | Round Robin load balancing algorithm

Round Robin is the most straightforward algorithm that uses the concept of quantum time. In Round Robin, each virtual machine will be allocated a quantum time. Once the time quantum completes, another virtual machine will get its turn to execute as shown in Figure 1. If the quantum time

10. Deep Learning Regression- Based Retinal Layer Segmentation Process for Early Diagnosis of Retinal Anomalies and Secure Data Transmission through Thing Speak

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Hindawi

Research Article

Deep Learning Regression-Based Retinal Layer Segmentation Process for Early Diagnosis of Retinal Anamolies and Secure Data Transmission through ThingSpeak

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Diabetic retinopathy (DR) is a progressive type of problem that affects diabetic people. In general, this condition is asymptomatic in its early stages. When the condition progresses, it can cause hazy and unclear vision of objects. As a result, it is necessary to develop a framework for early diagnosis in order to prevent visual morbidity. The suggested method entails acquiring fundus and OCT images of the retina. To acquire the features, techniques such as preprocessing, sophisticated Chan-Vese segmentation, and object clustering are used. Furthermore, regression-based neural network (RNN) categorization is used to achieve expected results that help foretell retinal diseases. The methodology is implemented using the MATLAB technical computing language, together with the necessary toolboxes and blocksets. The proposed system requires two steps. In the first stage, the detection of diabetic retinopathy via the proposed deep learning technique is carried out. The data collected from the MATLAB are transmitted to the approved PC via the IoT module known as ThingSpeak in the second stage. To validate the robustness of the proposed approach, comparisons with regard to plots of confusion matrices, mean square error (MSE) plots, and receiver operating characteristic (ROC) plots are performed.

1. Introduction

The medical industry is currently attempting to gain a significant advantage as the number of wearables, tablets, and virtual reality applications for Internet of Things (IoT) users has grown significantly. In this process, the combination of image processing with deep learning and data transfer IoT has become one of the most commonly used procedures today. An image can be improved or data can be extracted by using image-processing techniques to perform various operations to the image. According to the application, a picture or a set of characteristics or features can be generated by this type of signal processing [1]. Image analysts use a number of interpretative basics while working with visual tools [2]. Digital photographs can be altered using computers and digital image-processing techniques. When employing digital approaches, all kinds of data must undergo preprocessing, augmentation, presentation, and information extraction.

Colour fundus imaging and OCT are two of the most common imaging modalities used by an ophthalmologist. The colour fundus image depicts the retina's two-dimensional image quite effectively. The retina's reflection on the fundus camera [3] is captured and used to create a fundus

11. Protein Secondary Structure Prediction Using Deep Independent Convolution -Bi - LSTM

Protein Secondary Structure Prediction Using Deep Independent Convolution - Bi-LSTM)

Dr. Y. Rama Devi*, K. Mary Sudha Rani, Dr. Rupesh Mishra, Syed Shakeeb Assil & Sohail Qureshi

Keywords: CNN, LSTM, SVM, HVM, BiLSTM, DEEP IC.

Abstract

Nowadays, the protein Prediction for secondary structure from the long chain of the amino acid sequence is a complex bioinformatics problem. New challenges for engineering purposes is to design new proteins

using in the way of good principles and methods. Current computational modeling methods for protein design still requires a lot of human intervention and oversight. We propose a model Deep Independent Convolution - Bidirectional Long Short Term Memory (Deep IC - BiLSTM) which is a hybridization of Convolutional Neural Network (CNN), Long Short Term Memory(LSTM), Attention Model, and Deep Bidirectional Long Short Term Memory. We test the effectiveness of the model by predicting the Q8 secondary protein structure on CB6133 and CB513. Our method is capable of quickly producing sequentially plausible solutions that achieved 92% accuracy outperforming other famous prediction models.

12. Design and Implementation of Brain Tumor Segmentation and Detection Using a Novel Woelfel Filter and Morphological Segmentation

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WILEY | Hindawi

Research Article

Design and Implementation of Brain Tumor Segmentation and Detection Using a Novel Woelfel Filter and Morphological Segmentation

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Neuroimaging is critical in the diagnosis and treatment of brain cancers; however, the first detection of tumors is a challenge. Detection techniques like image segmentation are heavily reliant on the segmented image's resolution. Magnetic resonance imaging (MRI) tumor segmentation has emerged as a new study area in the medical imaging field. This spongy and delicate mass of tissue is the brain. Stable conditions allow for patterns to enter and interact with each other. To put it simply, a tumor is a mass of tissue that has grown unchecked by the natural mechanisms that keep it under control. When cells divide uncontrollably, they create a cancerous tumor. Brain tumors can be detected and segmented using a variety of methods. A new method for detecting brain tumors using MRI images is presented in this research. An innovative Woelfel filter is used for enhancement, and morphological segmentation approaches combined with anisotropic diffusion are used for segmentation. Segmentation of brain tumors can be accomplished using thresholding and morphological techniques, which are both effective. The tumor will be located and identified using morphological image processing. Image denoising refers to the process of removing artefacts such as noise and aliasing from digital images. Here MATLAB programming language is utilized as it incorporates all the toolboxes required for the application involved in the work.

1. Introduction

Medical imaging research has resulted in the development of diagnostic techniques such as computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound. Each has its own set of pros and disadvantages. Medical imaging is the technique of creating images of the inside of the body in order to aid in the diagnosis of a medical condition. It not only aids in the treatment and identification of sickness but also allows for the discovery of inner structures that lay beneath the surface of the skin and bones, which is quite useful. It identifies abnormalities by comparing them to a database of normal anatomy and physiology. The segmentation of brain tumors is a crucial topic in the field of magnetic resonance imaging (MRI). Image segmentation is the process of breaking down a complex image into smaller, more manageable segments for simpler analysis [1]. An MRI scan of the brain is one of the most regularly used diagnostic procedures for the detection of brain tumors. The magnetic resonance imaging (MRI) machine operates in the same way. During scanning by a radio transmitter, an antenna (coil) captures a radio wave generated by the patient's body. The radio transmitter then delivers a radio wave through the patient's body, shaking the protons in the process, which then generates a new radio wave. When the new radio wave is received, it is processed by a computer algorithm, which results in the creation of the magnetic resonance image (MRI). Tumors can be classified into two categories: primary tumors and secondary tumors [2]. Malignant tumors, on the other hand, are cancerous tumors that spread over a

13. Enabling effective location-based services for road networks using spatial mining

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Enabling effective location-based services for road networks using spatial mining

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***Abstract*---A co-location pattern represents a subset of Boolean spatial attributes whose instances are located in a close geographic space. These patterns are important for location-based services. There are many methods for co-location pattern mining where the distance between the events in close geographic proximity is calculated using a straight-line distance called Euclidean distance. Since most of the real-time tasks are bounded to the road networks, the results computed using Euclidean distance is not appropriate. So to compute co-location patterns involving network we define a model where initially a network model is defined and the neighbourhood is obtained by using network distance. By comparing this approach with the previous Euclidean approach, the results**

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14. CNN-Based Brain Tumor Detection Model Using Local Binary Pattern and Multilayered SVM Classifier

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Research Article

CNN-Based Brain Tumor Detection Model Using Local Binary Pattern and Multilayered SVM Classifier

Morarjee Kolla,[1] Rupesh Kumar Mishra,[1] S Zahoor ul Huq,[2] Y. Vijayalata,[3] M Venu Gopalachari,[4] and KazyNoor-e-Alam Siddiquee[5]

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Academic Editor: Muhammad Ahmad

In this paper, an autonomous brain tumor segmentation and detection model is developed utilizing a convolutional neural network technique that included a local binary pattern and a multilayered support vector machine. The detection and classification of brain tumors are a key feature in order to aid physicians; an intelligent system must be designed with less manual work and more automated operations in mind. The collected images are then processed using image filtering techniques, followed by image intensity normalization, before proceeding to the patch extraction stage, which results in patch extracted images. During feature extraction, the RGB image is converted to a binary image by grayscale conversion via the colormap process, and this process is then completed by the local binary pattern (LBP). To extract feature information, a convolutional network can be utilized, while to detect objects, a multilayered support vector machine (ML-SVM) can be employed. CNN is a popular deep learning algorithm that is utilized in a wide variety of engineering applications. Finally, the classification approach used in this work aids in determining the presence or absence of a brain tumor. To conduct the comparison, the entire work is tested against existing procedures and the proposed approach using critical metrics such as dice similarity coefficient (DSC), Jaccard similarity index (JSI), sensitivity (SE), accuracy (ACC), specificity (SP), and precision (PR).

1. Introduction

Brain tumors develop as a result of unregulated and fast cell proliferation. It can be fatal if not addressed in the early stages. Machine learning techniques are used to assist clinicians in detecting brain tumors and making judgments. The progression in the deep learning procedures involving the best classifiers impacted a significant advance in medical image processing in recent years. A brain tumor develops when brain tissues develop abnormally. The malignant tissues outgrow the healthy cells, resulting in a mass of cells that eventually transform into tumors [1]. Magnetic resonance imaging (MRI) has been the gold standard for noninvasive brain tumor identification in the last few decades due to its improved soft tissue contrast [2, 3]. MRIs have a considerable impact on medical image processing and analysis due to their ability to provide high-resolution information about brain structure and abnormalities [4–6]. A malignant brain tumor grows significantly more quickly than a benign tumor and is more prone to spread to other parts of the brain. Primary malignant brain tumors have poor prognoses and greatly affect cognitive abilities as well as quality of life [7]. The analysis of medical images is critical in assisting people in diagnosing various disorders. The advanced medical imaging modalities are commonly used methods for analyzing anomalies in brain tissues, which can

15. Paddy Leaf Disease Detection Using Mask Region based Convolution Neural Network (Mask R-CNN)

Paddy Leaf Disease Detection Using Mask Region based Convolutional Neural Network (Mask R-CNN)

Dr T Sridevi*, K Mary Sudha Rani & Darai Rupa Maya

Keywords: Mask RCNN, leaf blast, brown spot, paddy leaf.

Abstract

In this paper, the state-of-the-art CNN algorithm for object detection and pixel-wise segmentation i.e., Mask R-CNN, originally developed to identify the number of instances in a particular image. With this experiment, we show the application of object detection in the plant pathology domain. The model, developed using the Mask R-CNN framework, was limited to the two most commonly occurring paddy leaf diseases namely - leaf blast and brown spot.

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Issue
Vol. 41 No. 5 (2022)

Section
Articles

16. Private Blockchain-Cloud System (PBCS) for Healthcare Services

Private Blockchain-Cloud System (PBCS) for Healthcare Services

Sangeeta Gupta (Chaitanya Bharathi Institute of Technology, India)

Source Title: International Journal of Software Innovation (IJSI) 10(2)
Copyright: © 2022 Pages: 8
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Abstract

Blockchain in the recent times stands as a buzz word to deal with huge set of real time applications that function in a manual way rather than in an automated manner. There may be several intermediate phases involved to access legitimate records of significance in various sectors like financial industry, supply chain market, educational organizations, healthcare systems etc. But, when the amount of data is enormous, then manual steps to infer a conclusion after undergoing verification and validation phases, is a time-consuming approach. Hence, there is a necessity to automate the process flow using emerging tools and technologies such as blockchain. Towards this end, a novel Private Blockchain-Cloud System (PBCS) for Healthcare Services is proposed in this work. An model is presented to secure the patient records via e-block access platform where only the person holding the legitimate key can access the data. Security is further strengthened by deploying the blocks of a blockchain in cloud environment.

Article Preview

Top

Literature Survey

A majority of population from rural and urban areas visit nearby healthcare centers when affected with any illness or disease. The patients in those areas may either have complete knowledge of securing the records that are being shared with the healthcare staff or may be ignorant, particularly from rural areas. Towards this end, there is a need to secure the healthcare records of the patients undergoing treatments and diagnosis for various disease recovery mechanisms. There exists tremendous work in the literature to deal with preserving and ensuring security of healthcare records as presented in this section to

17. A Two-level Authentication Protocol for Secure M-Commerce Transactions using Encrypted OTP

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International Journal of Mechanical Engineering

A Two-Level Authentication Protocol for Secure M-Commerce Transactions using Encrypted OTP

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Abstract—

Trading is the crucial and defacto factor of the world's economic growth, has a lot of impact on any country's GDP. Trading has remarkably changed its shape from the ancient barter system to the latest mobile commerce because of enhancements in technologies, the Internet, the use of digital currency and human beings livelihood, and in this pandemic situation of CORONA where everyone is focusing on online/digital trading.

Because of upgradations in technology usage and a drastic improvisation in hardware front, the entire computational devices and mobile phones have changed their modes of usage, where 90 percent of market users are using palmtops, laptops and smartphones and the human beings lifestyle is also drastically changed where they want everything on a single click through mobile apps irrespective of time and location (anytime from anywhere). The so-called e-commerce is merged with mobile communications, which emerged into mobile commerce.

Mobile commerce, also called mobile e-commerce or m-commerce, is defined as all activities related to a potential commercial transaction conducted through communications networks that interface with wireless or mobile devices. Mobile Commerce addresses electronic commerce via mobile devices, where the Consumer is not in physical or eye contact with the goods that are being purchased.

The advantages are massive with mobile commerce from the customer's point of view and the manufacturer's point of view. However, there are also many complexities and network security issues involved with this mobile commerce, which doesn't allure many mobile users to opt for m-commerce transactions.

Many Cryptographic security algorithms and communication protocols were utilized to build a robust payment system for mobile commerce, but they still need some ifs and buts. This paper provides a "Two-Level Authentication Protocol for secure M-Commerce Transactions using encrypted OTP" using any conventional or public-key cryptosystem algorithm and any one of the Messaging Protocols.

The Solution provided in this paper will overcome two major security attacks called "Replay Attack." and "Man in the middle attack."

Keywords: M-Commerce, Cryptography, Authentication, E-Commerce, AMQP, Replay Attack, Man in the Middle Attack.

I. INTRODUCTION

Mobile commerce represents online transactions using cell phones, tablets pc, and any other handheld devices. These online transactions are due to online shopping or any other cash transactions. Nowadays, everyone uses Google pay, phone pe, and Paytm applications for transactions, and every bank provides a UPI facility[1].

M-commerce accounted for 34.5 percent of all e-commerce sales in 2017. M-commerce has the most significant impact on the small scale industry to large scale industries. Using this m-commerce, bill payment for utilities became very easy. Even though there are so many advantages, we have to concentrate on the security issues of m-commerce[2].

II. WIRELESS SECURITY

A. Public-key cryptography

Public key cryptography (PKC) is employed to exchange a personal key or symmetric key utilizing a certificate, and there, in any case, the transmission is encrypted using the transferred key. Small key size of 40 bits is employed due to power restriction.

18. Linear Ensembling of Time Series Ecological Variables of COVID 19

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International Journal of Mechanical Engineering

Linear Ensembling of Time Series Ecological variables of COVID19

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Abstract

In the present era almost all the policy makers need assistance for performing decision making of ecological variables that tends to avoid spreading of COVID which can be get rid of and this paper will assist the process of forecasting which is the major dropout of disease propagation. In this paper we present a model which comprises of a network to perform several predictions based on several factors using fuzzy logic to aggregate the responses for generating accurate predictions over multivariate time series data of India. Indeed the prediction errors provide us the decisive power to implement norms.

Keywords: Ensemble, Time series, COVID19, MAE, MSE, MAPE, RMSE

I. Introduction

In the very recent past we have identified that huge increase in infection of COVID19 Corona virus around the world and India lead to lockdown and curfews in most of the places in INDIA to break the chain of infection till 20 February 2022. This may be due to momentum of public during festival season as specially by February 5th 2021 3.95 Cr cases were registered and 5.21 people died due to COVID19 and 96.2% recovery rate was identified in India alone.

The Time series classification (TSC) is a kind of machine learning where the input vector features consists of real valued scenario that adds complexity layer problem with distinct characteristics of data over traditional algorithms [15].

The multi-variant time series classification comprises of pair of observations denoted by $(x_1,\ldots,x_m)$ which is a discrete class of time series variables denoted by variable of class y with c possible values for mapping the space of possible inputs with d dimensions and m observations in a vector denoted by $X=<x_1,\ldots,x_d>$ where $x_k=(x_{1,k},x_{2,k},\ldots,x_{m,k})$ denoted by j^{th} observation with i dimension by using the scalar value of $x^{i,j}$.

Most of the ensemble predictions are performed for enhancing the predictions with exogenous variables to implement the distinct ensemble methods to perform selection in a strategy for selecting the appropriate model and for computing the weights by considering the meta models for integration of exogenous variables to implement distinct selection strategies for selecting the base models that pool by performing selection of best models based on the training error evaluation.

II. Literature Review

The study of propagation related to COVID-19 in India is applied using nonlinear autoregressive forecasting for the prevalence of virus as the authors modeled confirmed cases using the time series dataset to compare various regressive approaches like BATS [8] and TBATS [9] model and compared each of the features in the dataset and illustrated the results in the month of March by implementing the exponential smoothing using five forecasting rounds that cumulate the confirmed cases [1].

Another work proposed to implement the Holts Linear [2] model to forecast COVID19 cases in India using "Mean Absolute Percentage Error (MAPE)" [7] and the authors outperformed the model as the authors selected to perform the six prediction techniques for forecasting the cumulative cases as the proposed methodology is effective in predicting the sequential data [2].

An exponential growth is estimated using the ending points to verify the outbreak being applied as a variation to forecast the recovered and confirmed cases [3]. The recent advances in deep learning have revolutionized the healthcare industry as the various applications have been implemented and commercialized by incorporating the AI-driven healthcare providers who perform accurate diagnostics [4].

One of the researches propose a novel deep learning architecture which s trained over data obtained through 3D CT volume of lungs to split into various 2D patches and being fed as an encoding part for performing the feature extraction process in encoding the module into two sub-networks for segmentation joint classification and segmentation [5].

19. Improvement of Data Security and Privacy in the Wireless Sensor Network Using Elliptical Curve Cryptography

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Improvement of Data Security and Privacy in the Wireless Sensor Network Using Elliptical Curve Cryptography

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Abstract - With the expanding use of wireless sensors in a number of applications, including the Internet of Things, academics have focused on the security aspects of wireless sensor networks. Designing efficient security algorithms for wireless sensor networks has always been a difficulty due to resource limits in wireless sensor networks. This paper presents an elliptic curve signcryption-based security protocol for wireless sensor networks that provides anonymity, confidentiality, mutual authentication, forward security, secure key establishment, and key privacy while also resisting replay, impersonation, insider attack, offline dictionary attack, and stolen-verifier attack.

Keywords: Elliptic curve cryptography, User Authentication, Access control, Wireless Sensor Networks

Introduction

The security of wireless sensor networks is becoming increasingly important as they grow more ubiquitous. This is especially true for products like medical sensors, where confidentiality is critical. These devices frequently communicate sensitive data, necessitating the use of a cryptographic technique that ensures data confidentiality and integrity, as well as the legitimacy of people using the sensor network's devices. All of these are provided by public-key cryptography, but, owing of computational and battery power limits, the most prevalent public-key algorithm (RSA) cannot be used because it is too computationally expensive. Because it requires substantially smaller key sizes, Elliptic Curve Cryptography (ECC) presents an option that provides comparable security strength with significantly less computation.

Data encryption, digital signatures, user authentication, and other applications have all made substantial use of public-key cryptography. In comparison to the widely used symmetric key cryptography in sensor networks, public-key cryptography offers a more flexible and straightforward interface that requires no key predistribution, pairwise key sharing, or a sophisticated one-way key chain mechanism. However, there is a widespread perception in the sensor network research community that public-key cryptography is not feasible since the required computational intensity is incompatible with sensors with limited processing power and energy budget. The preliminary investigation appears to debunk this myth.

The Wireless Sensor Network (WSN) is a self-organizing network that consists of a collection of sensor nodes that collect environmental data and communicate it to a sink or base station. The information can be gathered from the base station for further assessment. Sinks in WSNs can be either static or dynamic. For some applications, a static sink is utilised as a battlefield environment, whereas a dynamic sink is used as a disaster management system.

20. Audio Enhancement and Denoising using Online Non-Negative Matrix Factorization and Deep Learning

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Audio Enhancement and Denoising using Online Non-Negative Matrix Factorization and Deep Learning

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Abstract: *For many years, reducing noise in a noisy speech recording has been a difficult task with numerous applications. This gives scope to use better techniques to enhance the audio and speech and to reduce the noise in the audio. One such technique is Online Non-Negative Matrix Factorization (ONMF). ONMF noise reduction approach primarily generates a noiseless audio signal from an audio sample that has been contaminated by additive noise. Previously many approaches were based on non-negative matrix factorization to spectrogram measurements. Non-negative Matrix Factorization (NMF) is a standard tool for audio source separation. One major disadvantage of applying NMF on datasets that are large is the time complexity. In this work, we proposed using Online Non-Negative Matrix Factorization. The data can be taken as any speech or music. This method uses less memory than regular non-negative matrix factorization, and it could be used for real-time denoising. This ONMF algorithm is more efficient in memory and time complexity for updates in the dictionary. We have shown that the ONMF method is faster and more efficient for small audio signals on audio simulations. We also implemented this using the Deep Learning approach for comparative study with the Online Non-Negative Matrix Factorization.*

Keywords: *Noise Reduction, Additive Noise, Non-Negative Matrix Factorization, Deep Learning.*

I. INTRODUCTION

Generally audio contains both necessary and unnecessary audio segments in it. When audio is recorded such as speech, the speaker's required voice is recorded and also the noise of that environment is added to the audio file. This noise in the recording cause problems for the person who is listening as the speech can not be heard properly. These noises must be reduced or removed so that we get a clear speech. Removal of noises from the speech without affecting the quality of speech is known as Audio Denoising. It is also known as Speech Enhancement. It enhances the quality of speech.

Audio denoising is recently done using NMF. In this method, factorization of a non-negative data matrix is done as a product of a dictionary matrix and code matrix. While using this method, we require the entire matrix to be loaded first. This method may not be useful in applications that contain large datasets or when the input data is given in a streaming fashion.

This paper introduces Online Non-Negative Matrix Factorization (ONMF). This algorithm was developed for streaming data or when the dataset is very large to store locally. This algorithm is used to load only some part of a dataset at a time. This method uses less memory than the traditional NMF method and performs better in real-time denoising.

In this paper, we also implemented audio denoising using the Deep Learning approach for comparative study. The results of these three algorithms are compared to suggest a better approach. Compared to the previously implemented algorithms, ONMF and Deep Learning approaches are more useful for audio denoising and speech enhancement.

The rest of the paper contains the following sections. The algorithms used for this paper are explained in section II. Results and discussions are presented in section III. Conclusions and future scope are given in section IV.

II. RESEARCH METHODOLOGY

A. Non-Negative Matrix Factorization

NMF understands dictionaries for the real signal and noise from a recording that is noiseless and a pure-noise recording that is thought to be structurally similar to the signal of interest.

21. Contactless Gesture Based Interaction with Devices

Contactless Gesture Based Interaction with Devices

K Mary Sudha Rani* & Dr T Sridevi

Keywords: Contactless gesture, devices etc.

Abstract

Contactless Gesture Based interaction with devices aims to offer new possibilities to interact with machines thereby enabling development and design of far more natural and intuitive interactions with computing machines.

Gesture based interaction is the mathematical interpretation of human motion by a computing device. Our application aims to enable automatic interpretation of gestures based on computer vision.

Modern research is tending to move from standard peripheral devices to remotely commanding computers through speech, emotions, and body gestures.

This project belongs to the domain of hand gesture recognition using video image processing and pattern recognition to interact with the device. It aims to eliminate the concept of contact from various essential day to day tasks.

22. Complex Human Activity Recognition with Deep Inception Learning and Squeeze-Excitation Framework

Complex Human Activity Recognition with Deep Inception Learning and Squeeze-Excitation Framework.

- **Source:** Journal of Information Assurance & Security. 2022, Vol. 17 Issue 2, p80-90. 11p.

- **Author(s):** Kavati, Ilaiah; Akula, Venkatesh; Babu, E. Suresh; Cheruku, Ramalingaswamy; Kumar, G. Kiran

- **Abstract:** Human Activity Recognition (HAR) based on sensor networks is of paramount importance in the fields of body area networks, ubiquitous and pervasive computing. HAR is widely used in applications such as health monitoring, medical care, smart homes etc. With the advent of sensor networks and the fast-growing waveform data in the technologically developing modern world, the traditional feature engineering methods are becoming more obsolete. Deep Learning methods are very beneficial as they are efficient in feature extraction, helps in modelling the sensor data systematically and improving the performance of complex human activity recognition. Taking advantage of deep learning techniques, we propose a model based on Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN). To this we integrate a special feature recalibration framework based on attention mechanism to perform human activity recognition. The model uses Inception Neural Network architecture with various kernel-based convolution layers to extract spatial features and Gated Recurrent Units (GRU) to model temporal / time-series features. Space and Channel based Squeeze and Excitation blocks (SCbSE) framework is used to recalibrate features to complete classification tasks of complex human activities. The proposed model is experimentally verified on two publicly available benchmark HAR datasets namely: Smartphone Dataset and Opportunity dataset. The performance of the model is analysed while comparing to that of the state-of-the-arts.

23. Box-Ofce Analytics and Movie Recommender System Using Machine Learning Algorithms

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Box-Office Analytics and Movie Recommender System Using Machine Learning Algorithms

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ABSTRACT
The film industry has boosted up with hundreds of movies during the pandemic. The film makers have tough and challenging time to produce movies which the audience are willing to watch. People all around the globe are binge watching their favorite movies and web – series in their pastime. Filmmakers are trying to boost up the quantity and quality of their projects because of high competition they are facing. Filmmakers need help to identify the kind of genres that people are willing to watch and also the film watchers with personalized recommendations.
A common platform is built for both film makers and viewers for predicting box office success and data analytics for analysing trends in audience's interests. The Film makers will be equipped with features such as predicting the box office success of their project using various parameters that the machine learning model has been trained on. They can understand and analyse the social media engagements and strategies accordingly. Also, the film makers can make use of the Location suggestion feature to get the suggested locations for cunning various scenes of their movies / web – series. On the other hand, the general audience will be able to use recommendation systems based on parameters like genre, OTT Platform and many others. They can also vote for the genres they are willing to watch which would help the film makers in understanding the interests of the audience. In this paper, the model was tested using various machine learning algorithms such as linear regression, decision tree regression and gradient boosting regression. Gradient boosting regression has shown better results with r2 score of 0.8960.

Keywords: *Content Based Filtering, Collaborative Filtering, Box-Office Prediction, Social media Analytics, Film Recommendation*

1. INTRODUCTION

The film-makers are having a great competition to grab box-office success due to the high demand of entertainment required by viewers due to the pandemic. Film - makers are investing crores of rupees for making quality films. So, Box Office success is of utmost importance for the film-makers to recover their investment. On the other hand, the general audience is also overwhelmed with lots of content across various OTT platforms. So, there is a need for a recommender system that can provide the viewers with the best recommendations. The objective is to create an application, common for both Filmmakers and viewers. Filmmakers can use the predicted Box Office figure so as to get an idea of the optimal budget to be invested. The Filmmakers also can get help from social media platforms such as Twitter and Youtube by viewing analytics related to their film. This would help them in controlling production costs and also understand the preferences of viewers. Film viewers will get recommendations across various OTT platforms based on their preferred genres and OTT platform preferences. For film viewers, we will be building a recommender system that will suggest films across various OTT platforms to which they have subscribed. The Algorithms to be used here are Content - based filtering and Collaborative filtering.

Content based filtering [12] uses item features to recommend other items similar to what the user likes, based on their previous actions or explicit feedback. The model doesn't need any data about other users, since the recommendations are specific to this user [14]. The model can only make recommendations based on existing interests of the user. In other words, the model has limited ability to expand on the users' existing interests.
Collaborative filtering is used to address some of the limitations of content-based filtering. Collaborative filtering [15] uses similarities between users and items simultaneously to provide recommendations. This allows for serendipitous recommendations; that is, collaborative filtering models can recommend an item to user A based on the interests of a similar user B. To predict the Box Office figure for a film, regression algorithms will be used since a continuous value is to be predicted, not a discrete value.

Multiple Linear Regression algorithm shows a linear relationship between a dependent (y) and one or more independent (x) variables, hence called linear regression [16]. Since linear regression shows the linear relationship, which means it finds how the value of the dependent variable is changing according to the value of the independent variable. Multiple linear regression is an extension to simple linear regression. In this setup, the target value depends on more than one variable.

24. A COMPARATIVE STUDY ON YOUTUBE SPAM COMMENT DETECTION USING VARIOUS MACHINE LEARNING ALRORITHMS

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A COMPARATIVE STUDY ON YOUTUBE SPAM COMMENT DETECTION USING VARIOUS MACHINE LEARNING ALGORITHMS

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Abstract: People now feel more comfortable socializing over the internet through popular social networking and media websites than face to face interaction. Thus, the social media websites are thriving more nowadays. YouTube is a vastly popular social media site which is expanding at very fast pace. YouTube depends mostly on user created contents sharing and spreading videos. However, due to this popularity, YouTube has become more susceptible to unwanted and malicious spammers. The increase in quality of online social networks, it has become easy for the spammers to implement malicious activities into the websites by adding spam messages in the comment section of the videos. This paper classifies whether the youtube comments are legitimate or spam comments. Few sample datasets are taken and trained on different models. Each model classifies spam and non-spam comments. An optimal model is being chosen (high accuracy model) and is deployed into web application. This web application takes a YouTube video link as input and detects spam comments in it. The accuracy of model is been observed as 95%.

Index Terms **– spam comments, classification, logistic regression, random forest**

I. INTRODUCTION

Social networking has been occupying major time of daily schedule. It has become an integral part of human lives. People look up to social media for other human interaction, sharing ideas, obtaining knowledge, entertainment and being informed about the events happening around the world. Among these websites, YouTube is one of the most popular website for sharing and viewing video content. This popularity of YouTube has its own side effects because it attracted spammers, who upload videos with the sole purpose of polluting the system content and causing dissatisfaction among other viewers. The spam videos can have lot of videos which may be unrelated to their title or may contain pornographic content. Therefore, it is very important to find a way to identify such videos and report them before they are viewed by users. YouTube themselves have been blocking the comments like URLs in the comment section. Such methods have proven to be extremely ineffective as spammers have found ways to bypass such heuristics. Standard machine learning classification algorithms have proven to be somewhat effective but there is still room for better accuracy with new approaches. To design a model which detects YouTube spam comments in real time using machine learning classification algorithms by taking YouTube video URL as input. This technology can be leveraged for various purposes and in fields. As every process these days is being automated here are a few applications of this project idea. Among different kind of undesired content, YouTube is facing problems to manage the huge volume of undesired text comments posted by users that aim to self-promote their videos, or to disseminate malicious links to steal private data. To stop such kind of activities this spam detection can be supportive.

II. LITERATURE SURVEY

Simran Kanodia et al. [1] in the paper titled "A Novel Approach for Youtube Video Spam Detection using Markov Decision Process" used markov decision process to detect the YouTube spam comments. This model gave approximately 78.8 % accuracy. A Markov Decision Process (MDP) is a mathematical model that is used to make decisions in a stochastic way. A stochastic environment has outcomes which are partially random. They are under the decision maker's control. The environment in MDP is modeled as a discrete-time state-transition system with a set of actions and states. The state is represented as the outcomes of the decision-making process, an action is represented as a decision which can be taken from a particular state. The agent receives a reward as a consequence of the decision it chooses from a particular state. The aim of the agent is to maximize the total reward

25. A Time Series Forecasting with diferent Visualization Modes of COVID-19 Cases throughout the World

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A Time Series Forecasting with different Visualization Modes of COVID-19 Cases throughout the World

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Abstract: *In real world applications, one of the prosperous field of science is time series forecasting due to its recognition though having some challenges in the development of methods. In medical field, time series forecasting models have been successfully used in various applications to predict progress of the disease, measure the risk dependent on time and the mortality rate. However due to the availability of many techniques which excel in each of a particular scenario, choosing an appropriate model has become challenging. When a huge dataset is considered it is obvious that machine learning is the best way to perform predictive analysis or pattern recognition tasks on the data. Before machine learning can be used, the time series forecasting problems should be reframed into supervised learning problems. The purpose of machine learning in this field is also to tackle the different challenges like data pre-processing, data modelling, training and any other refinement required with respect to the actual data. This paper deals with the predictive analysis and various visualization applications for time series forecasting of COVID- 19 patients throughout the world.*

Keywords: *Analytics, visualization, prediction, Time series forecasting, COVID-19.*

I. INTRODUCTION

The diverse industries like finance, supply chain management, production, inventory planning and medical are using the time series forecasting which is the most useful technique. Time series talks about the series of observations that are gathered in constant intervals of time that can be daily, weekly, monthly, or yearly. Time series analysis involves the development of various models which describe and understand the observed time series about the dataset. This involves interpretations and creating ideas about the given data. The complex processing of current and previous data is done and a best fitting model is formed to predict the future observations. Thus, machine learning proved to be the most effective for pattern analysis and prediction of the sequence in structured as well as unstructured data [1]. One important difference we must know is between prediction and forecasting.

A. *Prediction and Forecasting*

1) The outcomes of the unseen data are assessed using Prediction. A model is fit to the training samples which forms an estimator called f(z) which can estimate for the new samples z. A sub- type of Prediction is forecasting which makes predictions of the future sample data based on time i.e. the time series data. Thus, the only difference between the forecasting and prediction is the historical dimension. The components of Time series forecasting are
2) Trend is to describe the growing or shrinking behaviour of time series data.
3) Seasonality is to highlight the repeated pattern or cycles of behaviour over time.
4) Noise/ irregularity is to describe the non – methodical aspect of time series deviating from common model values.
5) Cyclic property is to identify the repetitive changes in the time series and its positioning in the cycle.

The methods to implement Time series forecasting can be classified as

B. *Classical Methods*

1) *Naïve Model:* For naïve forecasts, all forecasts are set to be the value of the last observation. In many cases, Naïve models are applied as a random walk (the last observed value is used as a unit for the next period forecast) and seasonal random walk (with a value from the same period of the last observed time span which is used as a unit of the forecast).
2) *ARIMA/ SARIMA:* ARIMA stands for Autoregressive Integrated Moving Average model used to build a composite model of the time series. AR, Autoregression uses the dependency relationship between the observation and few other lagged observations. I, integrated means the use of differentiation between the raw observations to make the time series "stationary". MA, Moving Average uses the dependency between an observation and residual error. SARIMA stands for Seasonal Autoregressive Integrated Moving Average to broaden the application of the ARIMA by including a linear combination of seasonal past values and forecast errors.

26. Optimization-based spectrum sensing in crn for efective utilization of available channel

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Optimization-based spectrum sensing in CRN for effective utilization of available channel

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***Abstract*---Cognitive radio networks (CRN) are subjected to the challenge of demand in available resources, limited fair resource allocation between users in the heterogeneous CRN. The availability of minimal resources affects the channel allocation between Primary Users (PUs) and Secondary Users (SUs). In heterogeneous CRNs, efficient resources are available to SUs with fair resource allocation in a multi-hop environment. This paper proposed an efficient resource allocation in multi-hop CRN through Monte-Carlo Normal Form (MCNF). The proposed MCNF is involved in the optimization of the available resources through the estimation of the objective function. With Monte-Carlo estimation, MCNF computes the optimal resource availability within the CRN. Based on the Normal Form game theory resource availability of the network is computed and allocated between the users. The performance of the proposed MCNF is computed in terms of throughput, PDR, and running time. The proposed MCNF is comparatively examined with conventional game theory and the Monte-Carlo technique. The simulation analysis of the proposed MCNF expressed that running time is reduced with increased Packet delivery rate (PDR) and throughput.**

***Keywords*---Cognitive radio networks (CRNs), secondary users (SUs), Channel Allocation, Optimization, MCNF (Monte -Carlo Normal Form).**

1. Introduction

In recent years, the wireless communication environment exhibits drastic advancement toward the significant allocation of the radio spectrum. The primary issue associated with the wireless communication medium is the significant utilization of the available radio spectrum. In wireless radio technology, spectrum availability is limited and expensive for available resources. The drastic

27. Cloud Based Point of Sale System with Face Recognition

Cloud Based Point of Sale System with Face Recognition

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Abstract : A Point of Sale (POS) is an electronic banking outlet that enables customers to complete the basic financial transactions using debit or credit cards without the aid of bank representative or teller. It is an electronic banking outlet that enables customers to complete the basic financial transactions using debit or credit cards without the aid of bank representative or teller. The Traditional POS system runs on closed networks and the user data is stored on local servers. They need to be updated manually on-site. POS systems generally accept credit and debit cards to process bills. It is found that there is increase in levels of fraud among the users of credit and debit card. So there is a requirement to build a system that can store the data securely and also do the transactions without giving scope to any fraudulent activities. For the effective and efficient operations of security systems, accurate and automatic recognition of persons is becoming increasingly important. As a solution our proposed system 'Cloud Based POS System with Face Recognition and Password with Cloud implementation' is proposed as a method of payment making POS systems both card less and cashless. FaceNet which was proposed by Google Researchers was used for implementing face verification and recognition, along with password verification as a two-step authentication. We use FaceNet and Multi-Task Cascaded Convolutional Neural Network, for detection and identification of faces. This POS systems will do more, than just accepting payments. Here we also try to Integrate Cloud Computing (CC) with the system which makes it more secure. The combination of POS system with Cloud Computing will make our new systems more reliable and faster. It is studied that this technique is not very expensive and it gives us an accuracy rate of about 96.75%.

***Index Terms* -. POS, Cloud Computing, FaceNet, MTCNN , Face Recognition.**

I. INTRODUCTION

A point-of-sale system, or POS, is the place where a customer makes a payment for product or services at a store. Simply put, every time a customer makes a purchase at a store, they are completing a point-of-sale transaction. It is a combination of hardware and software and used primarily by a business to process customer purchases.

POS systems generally accept cash, credit and debit cards to process bills. In recent times in credit card transactions many fraud and security issues are present. Cryptographic keys were fetched and are utilized to achieve privileged access and sensitive information of card holders are stolen. Also, credit card thefts are becoming quite common. It is found that there is increase in levels of fraud among the users of credit and debit card. Information is being stolen by the hackers and used to make fraud transactions. It has been seen that the card information gets stored in POS s In order to decrease the crime happening in massive level a protection profile for Point of Sales System, there is need to enhance the security of the users. Now there exists no 'Point-of-Sale' system that gives full security to the users. Thus, a Point-of-Sale System with an innovative feature such as secure payment gateway by two step authentication, i.e. face recognition using FaceNet and password verification, that make forecasts at a real store considering the real time data specific to the domain and at the same time providing users security with the credit card data is needed, to improve the current models.

II. LITERATURE SURVEY

There are many existing solutions available for the secure payment at the payment gateway. The incorporation of fingerprint biometric recognition as an additional layer of protection to the customary pin and password requirements to gain permission to pay for goods purchased and services rendered using point of sale device can guarantee the secured transaction[11]. But it is possible that our fingerprints can be identified from public photographs that show our hands. Therefore, fingerprint scanning can't guarantee the secured transactions. And hence, Iris scan was introduced at the authentication level of the existing POS machine[12]. The experimental results shows that the system could significantly minimize cardholder fraud at the POS machine but not at a high rate. Currently, face recognition is used as a technology to provide multiple security in various practices likes verification of identity, access authority, observation, to replace passwords and identity cards that are no longer safe. The use of face recognition has the benefit of verifying personal data because, inhuman faces things like irises, retinas, faces are very unique to each other. For the effective and efficient operations of security systems, accurate and automatic recognition of persons is becoming increasingly important.

Face recognition, is one branch of computer science, is an ability to recognize or identify the person's identity by analysing the pattern-based facial contours of human faces. Face recognition has many methods in its application today. For example, Haar Cascade[5], Principal Component Analysis (PCA)[3], Linear Discriminant Analysis (LDA)[6], and Deep Learning[4][2]. Haar feature is a wavelet-based feature that decomposes image. The principle of the process is, the parameter of the image is detected whether it has face characteristic or not. If it has the separation stage of face and background, the image will be processed for further classification. The formula of Haar feature is, the average value of the result is above the threshold, it means the Haar feature exists. The closer the value to 1, the more likely we have found the face. Haar cascade face detection can detect images at different scales. But the major drawback is that it gives false results as well as it doesn't work on non-frontal images[5].

28. Asset Tracking System using Blockchain

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Asset Tracking System using Blockchain

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Abstract*— The technique of following a product or a batch of things throughout the supply chain to ensure that the products that reach clients are authentic and tamper-proof is known as asset tracking. The ultimate goal of an asset monitoring system is to track products along the supply chain, verifying that they haven't been tampered with and, if they have, pinpointing where the tampering took place. Traditional tracking technologies, such as BLE (Bluetooth Low Energy Beacon), which works within a limited range, RFID, and above-mentioned systems, are expensive and centralised. So, for this project, we'll use Blockchain Technology, which is an immutable, tamper-proof, decentralised distributed ledger with security features that allows us to establish an asset tracker that can follow our product along the supply chain. Ethereum is used to implement the system. Unlike other methods, there are no hardware components or large gadgets that may be removed from the original object and attached to the copy.

***Keywords*— Blockchain, Supply Chain, Smart Contract, Keccak-256, Ethereum,GUI**

I. INTRODUCTION

The majority of logistics operations rely on paper or easily editable internet documents.The finding of a fake item is currently the greatest challenge. Fake things have a huge negative impact on the business and the clients' health. As a result, item makers are facing significant difficulties. All of this is no longer an issue thanks to Blockchain technology. You can generate a document that is saved in a decentralized network and shared with all stakeholders in the supply chain, but it cannot be altered or manipulated once it is entered.The suggested system focuses on asset tracking between each two parties in a supply chain, as well as asset validation at each stage. The manufacturer, supply chain entities, client, and arbitrator are the system's major entities. Smart contracts allow buyers and sellers to conduct transactions independently. We propose a blockchain-based decentralised Asset Tracking System in which buyers and sellers engage via a contract that mimics an exchange.

II. LITERATURE SURVEY

This study employs Blockchain technology to track assets along the supply chain, ensuring that no product is tampered with at any point. Depending on the product, every product has either packaging or its own body that can be used to trace it throughout the supply chain. The ultimate purpose of asset tracking systems is to trace the path of products through the supply chain, ensuring that they have not been tampered with and, if they have, identifying exactly where the tampering occurred.This study employs a decentralized Blockchain technology technique to demonstrate that buyers are not entirely reliant on merchants to determine whether or not things are real. It describes a decentralized Blockchain system with anti-counterfeiting features, allowing manufacturers to supply authentic products without needing to run direct-operated outlets, potentially lowering the value of product quality assurance. Customers can use the recommended technologies to identify counterfeit goods in the supply chain. Customers can scan QR codes attached to products to get information like transaction history and current owner, which can be used to assess whether or not a product is genuine.

III.PROPOSED SYSTEM

A. User Interface Module

It's beneficial to have an interface where users or customers can check on the status of their assets and where the manufacturer may generate and transfer assets. The web portal contains many modules for producing assets, transferring ownership, and looking for assets. The Manufacturer is given a unique Ethereum address, and that address is the only one with the ability to manufacture the asset. The map API in the search asset module can display the asset's coordinates, allowing users to see where the object is located. PHP is used to develop the web interface, which also includes web3.js. Figure 1 shows the proposed system's architecture diagram, which shows how users (such as manufacturers, supply chain participants, and buyers) can communicate with blockchain and update the asset's state via the gui. The system design in Figure 2 depicts the application's flow as well as the verification requirements at each stage.

29. VIRTUAL COVID-19 PREDICTOR

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VIRTUAL COVID-19 PREDICTOR

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Abstract: COVID-19 tests are currently hard to come by-they are simply not enough of them and they cannot be manufactured fast enough, which is causing panic. Given that there are limited testing kits, we need to rely on other diagnosis measures. The financial costs of the laboratory kits used for diagnosis, especially for developing and underdeveloped countries, are a significant issue when fighting the illness. Using X-ray images for the automated detection of COVID-19 might be helpful in particular for countries and hospitals that are unable to purchase a laboratory kit for tests or that do not have a CT scanner. This is significant because, currently, no effective treatment option has been found, and therefore effective diagnosis is critical. The paper aims to develop a system that predicts the probability of a person getting infected with the corona virus using various sources of input. To benefit wide number of users we aspire to develop a mobile application which has variety of features like having a personal datastore to ensure all the information like reports are available at a single location. Many other personalised aspects like reminders are provided along with some location-based services.

Keywords: Convolutional Neural Network, Data Augmentation

1.INTRODUCTION

COVID-19 attacks one's respiratory tract, we can use X-rays along with detailed description of symptoms like user's travel history and user's physical contact with any infected person to analyse the patient's health condition by developing deep learning and machine learning models. Automating this procedure significantly reduces the time invested in the analysis process. This paper aims to perform that automation. The Model takes the advantage of TensorFlow and keras deep learning abilities, along with scikit-learn and matplotlib for pre-processing the images in the dataset and developing a model for image classification. Apart from X-Rays, CT Scans are also considered to be a great source to perform the prediction. Finally, it can be concluded based on the inputs if the person is infected with COVID or not. Convolutional neural networks were evaluated as of their ability to detect infected patients from chest X-ray images.

2.LITERATURE SURVEY

Kiran[1]proposed an automatic COVID screening (ACoS) system that uses radiomic texture descriptors extracted from CXR images to identify the normal, suspected, and nCOVID-19 infected patients. The proposed system uses two-phase classification approach (normal vs. abnormal and nCOVID-19 vs. pneumonia) using majority vote-based classifier ensemble of five benchmark supervised classification algorithms. It revealed that radiographic images can be used and examined to know if person is infected with COVID. The study reveals that infected patients exhibit distinct radiographic visual characteristics along with fever, dry cough, fatigue, dyspnea, etc. Chest X-Ray (CXR) is one of the important, non-invasive clinical adjuncts that play an essential role in the detection of such visual responses associated with COVID infection.It has the approach of multi classification as COVID, pneumonia and None.

Alazab[2]proposed the system that examines chest X-ray images to identify such patients.Findings indicate that such an analysis is valuable in COVID-19 diagnosis as X-rays are conveniently available quickly and at low costs. Empirical findings obtained from 1000 X-ray images of real patients confirmed that proposed system is useful in detecting COVID-19 and achieves an F-measure range of 95-99%. Owing to the limited availability of chest X-ray images, dataset was generated using data augmentation. Data augmentation is an AI method for increasing the size and the diversity of labelled training sets by generating different iterations of the samples in a dataset. Data augmentation methods are commonly used in ML to address class imbalance problems, reduce overfitting in deep learning, and improve convergence, which ultimately contributes to better results. The total number of images in the dataset became 1000 after applying augmentation. A concept called Data Augmentation to increase the data available for training purpose. The first use is the ability to generate 'more data' from limited data. The second one is to avoid overfitting. For a network it is somewhat problematic to memorize a larger amount of data, as it is very important to avoid overfitting. This occurs because the model memorizes the full dataset instead of only learning the

30. DETECTION AND EVALUATION OF MACHINE LEARNING BIAS

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DETECTION AND EVALUATION OF MACHINE LEARNING BIAS

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Abstract : Machine learning models are constructed using training data, which is biased and derived from human experience. Humans exhibit cognitive bias in their thoughts and conduct, which is reflected in the data acquired. The best machine learning models are said to mimic humans' cognitive ability, and thus such models are inclined towards bias. However, detecting and evaluating bias is important for better explainable models. In this paper, we aim to identify bias in learning models in relation to humans' cognitive bias and propose a novel technique for detection and evaluation of machine learning bias. In this paper, we try to detect the bias in the dataset. In the deployed dataset, the potentially biased attributes are observed. To detect bias, first we select some common biased attributes and then we use the concept of alternation function to swap the values of PBA's and evaluate the impact on prediction using KL Divergence. In this paper, we compare the KL divergence value obtained from different models used for training the dataset and predicting the output (average income).

Index Terms **– Bias in ML, cognitive Bias, bias detection and evaluation**

I. INTRODUCTION

Machine learning models are constructed using training data, which is biased and derived from human experience. Humans exhibit cognitive bias in their thoughts and conduct, which is reflected in the data acquired. When compared to the training data, bias is the amount by which a model's prediction departs from the target value. Bias in technology is a well-known problem. One potential avenue for continued bias is the code review process, it tends to rely more on past participation than anything else, and it can be a significant roadblock to people beginning their careers or joining a new organization. This paper provides an extensive insight into the technical and real-time work aspects of the project- Bias Detection (bias in dataset). The bias in the data set is detected by finding the Potentially Biased Attributes (PBA's) and the impact of these attributes on the prediction. The divergence is measured using the KL Divergence value. However, this data bias(KL Divergence value) includes themachine learning model bias, it is still considered as a challenging problem.The objective of this paper is to detect whether an attribute impacts the predictions if we alternate the values of that attribute. If a predictor is dependent onone or more PBA given the class label, it is considered biased. So, we try to detect whether an attribute is PBA and its impact on prediction.

2. METHODOLOGY

The application of machine learning models in the actual world has risen dramatically as technology has advanced. Prediction has become a crucial task in a variety of scientific and academic fields. We use datasets from many sources for this, and the data is acquired by humans, resulting in human cognitive bias. As a result, thepredictions of the machine learning model are skewed. For that, we employ analternation function to detect bias in the data set. We do this by using various machinelearning models to forecast the class label, which are then fed into the Sequential model, which then uses the model's prediction to determine the Potentially Biased Attributes.

31. Assessing Node Trustworthiness through Adaptive Trust Threshold for Secure Routing in Mobile Ad Hoc Networks

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Assessing Node Trustworthiness through Adaptive Trust Threshold for Secure Routing in Mobile Ad Hoc Networks

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Abstract—In the field of communication, Mobile Ad-hoc networks (MANET) have become popular and widely used. However, there are many security challenges in communication through these networks due to the presence of malicious nodes. The aim of this article is to present a novel adaptive threshold trust based approach for isolating malicious nodes to establish secure routing between source and destination. Many existing cryptography methods are complex and do not properly address the elimination of malicious nodes. Several trust-dependent mechanisms have been proposed that supplement old traditional cryptography- related security schemes. But it is observed that most of these trust based approaches are using direct trust and comparing with static trust threshold. This article proposes a novel method, secured trust with adaptive threshold (STAT) that uses the Adaptive threshold technique (APTT) combined along with secure trust based approach (STBA) to evaluate the node trustworthiness for efficient routing. Secure trust for a node is calculated based upon three tier observations that includes direct, neighbor, self-historical to enrich the trust factor and adaptive trust threshold is determined based upon network parameters dynamically. Node's secure trust is compared with adaptive trust threshold computed to isolate the malicious nodes from routing. The proposed method is compared with two cases where routing is performed without any trust calculation and routing with trust calculation and compared with static trust threshold approach. Results show significant performance of the proposed work in terms of metrics like packet delivery ratio, delay, throughput, false positive detection ratio and packet drop ratio. The proposed method STAT effectively isolates the malicious nodes and establishes secure routing.

Keywords—Node trustworthiness; misbehaving nodes; secure trust; static threshold; adaptive threshold; secure routing

I. Introduction

MANET's are considered to be connected on an infrastructure that provides better linkage between the nodes and its environment [1]. These networks are considered as a part of many applications today [2]. However, though its wide application in many fields, MANET's are vulnerable to many attacks and especially due to its dynamic network topology. These attacks can be overcome using many schemes which are related to the identifying the malicious nodes. These schemes work on the principle that the trust values of the nodes are to be calculated. Later these trust value calculations are compared to the static threshold values known as trust threshold in order to make appropriate routing decision by isolating the malicious nodes. This threshold defines the tolerability of a node in a network [3]. The security challenges of MANET's are identified in the case of their scalability, resource utilization, dynamic topology, and even power consumption and usage. Other challenges are related to the secure environments of the networks [4].

Many trust based schemes proposed have actually made use of static thresholds to identify trust of the node [5]. This type of methods are prone to drawbacks like high error rates. These error rates will influence the timeframe of dropping malicious nodes from routing. Nodes due to environment glitches may drop the packets in some cases. They may also be categorized as malicious nodes due to static threshold strategy which is taken without any consideration of network behavior. Network behavior plays important role in MANET's due to its infrastructure less hierarchy. Existing trust based mechanisms are based upon the two tier observations either direct or combination of direct and indirect trust computations. All these trust based approaches are comparing the evolved trust with static threshold for identifying malicious nodes. As MANET's are dynamic in nature, there is always a need to compute adaptive trust threshold based on network parameters that change dynamically time to time for every node. Every node should have its trust threshold factor computed dynamically. Node's trust value should be compared with adaptive trust threshold to decide its trustworthiness. It is observed form the limitations of the existing methods, there is need of computing node's trust factor with more sophisticated approach and calculation of node's trust threshold using network parameters in adaptive mode.

The proposed work deals with the isolation of malicious nodes. Secure trust computation scheme is used to compute nodes trust value and it is combined with adaptive trust threshold technique (STAT). The work emphasis on adaptive

32. Chest X-ray image-based Covid-19 Detection using Deep Learning Algorithm

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Chest X-ray image-based Covid-19 Detection using Deep Learning Algorithm

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Abstract: **The entire world is dealing with the Coronavirus, which has shattered our lives in innumerable ways. The number of people affected due to the virus is increasing at a pace that has been never witnessed before, leading to a rise in the need for medical facilities and equipment. In the digital revolution we exist in, every field of life is majorly reliant on technology for every daily need of life. Our study focused on developing a deep learning model for the detection of Coronavirus from chest X-ray images.**

To detect Covid-19 data pre-processing would be performed on the raw data of X-ray images. This is the first and the most crucial step as it prepares the data by avoiding the noise and missing values by converting it into a usable format that can directly be used for machine learning models. As the performance of deep learning neural networks often improves with the amount of data available, data augmentation techniques are used to artificially create new training data from existing training data.

Machine learning and Computer Vision techniques are further being implemented for other various operations. One hot encoding is performed as it allows the representation of categorical data to be more expressive since most machine learning algorithms cannot work with categorical data directly. VGG 16, a convolutional neural network architecture, efficient image classification, and localization mechanisms are applied. The accuracy and loss curves are plotted using the metaplot libraries to better the efficient visualization of the model.

Index Terms**-Covid-19,Convolutional Neural Network, Computer Vision, Chest X-ray images, Machine learning**

I. INTRODUCTION

The entire world is dealing with the Coronavirus, which has shattered our lives in innumerable ways. The number of people affected due to the virus is increasing at a pace that has been never witnessed before, leading to a rise in the need for medical facilities and equipment. There are limited kits for diagnosis, limited hospital beds for admission of such patients, limited personal protective equipment (PPE) for healthcare personnel, and limited ventilators. It is thus important to differentiate which patients with severe acute respiratory illness could have COVID-19 infection to efficiently utilize the limited resources. In this work, we propose using chest X-rays to detect COVID-19 infection in the patients' exhibiting symptoms of SARI. Using our tool one can classify a given X-Ray in one of the four classes: normal, bacterial pneumonia, viral pneumonia, and covid pneumonia. spacing

II. PROCEDURE FOR PAPER SUBMISSION

The use of X-Ray has several advantages over conventional diagnostic tests: 1. X-ray imaging is much more widespread and cost-effective than conventional diagnostic tests. 2. Transfer of digital X-Ray images does not require any transportation from point of acquisition to the point of analysis, thus making the diagnostic process extremely quick. 3. Unlike CT scans, portable X-Ray machines also enable testing within an isolation ward itself, hence reducing the requirement of additional Personal Protective Equipment (PPE), an extremely scarce and valuable resource in this scenario. It also reduces the risk of hospital-acquired infection for the patients. The main contribution of this work is in proposing a novel deep neural network-based model for highly accurate detection of COVID-19 infection from the chest XRay images of the patients. Further, given the novelty of the virus, many of the radiologists themselves may not be familiar with all the nuances of the infection and may be lacking in the adequate expertise to make a highly accurate diagnosis. Therefore, this automated tool can serve as a guide for those at the forefront of this analysis

III. METHODOLOGIES

33. A Novel Blood Group Detection Using Deep Learning

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Research Article

A Novel Blood Group Detection Using Deep Learning

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ABSTRACT

Division and tallying of platelets are considered as a significant advance that assists with separating highlights to analyze some particular ailments. The manual tallying of RBCsin minuscule pictures is an amazingly dreary, tedious, and off base procedure. Programmed investigation will permit hematologist specialists to perform quicker and more precisely. Examination of blood classification plays an imperative gathering in the restorative field for any treatment. False transfusion of blood will prompt numerous issues. This framework gives simple and quick methods for distinguishing proof of blood classifications and Rhesus factor none obtrusively. Our structure is tried on a few genuine informational collections of numerous individual images of human finger-tip images. Blood classification is grouped dependent on the nearness and nonappearance of certain organic substances called antibodies and furthermore dependent on the nearness or nonexistendence of acquired antigenic protein substances on the surfaces of the erythrocytes in the body. Along these lines by utilizing the optical properties of the antigens and the rhesus calculate present the blood, the blood gatherings can be ordered.

INTRODUCTION

Blood group identification is the key step to ensure blood transfusion safety. In the case of emergency blood transfusion, rapid identification of the type of blood is essential, directly related to the survival of the patient. Blood Typing system is basically used to determine the blood group that the person possesses. Blood Detection is most important and essential activity. The differences in the blood group of individuals are due to presence or absence of certain protein molecule named as antigens or antibodies. The antigen is any foreign substance that causes an immune response either alone or it forms a complex with a large protein molecule. Antibodies are the proteins produced by the immune system to defend against the foreign substances that may cause harm to our body; therefore, they are the guards of our body. The ABO blood group system is found and identified as the first human blood group system by Austria Rand Steiner in early nineteenth Century. There are 4 major blood groups based on presence or absence of antigen on the surface of RBC (Red Blood Corpuscles) . Blood groups are divided into four types i.e. A, B, AB and O. ABO blood group detection follows the agglutination method and then it goes for machine recognition. The agglutinationreaction means that occurred reaction between the antibody and the antigen, indicating the presence of the antigen. Group A has only the A Antigen on the blood cells

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Cervical Cancer Diagnosis Using Intelligent Living Behaviour of Artificial Jellyfish Optimized with Artificial Neural Network

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ABSTRACT Cervical cancer affects nearly 4% of the women across the globe and leads to mortality if not treated in early stage. A few decades before, the mortality rate was too high when compared to the present statistics. This is achieved as nowadays most of women are aware of this disease and undergo health examination mainly for screening cervical cancer on regular basis. But only the accurate diagnosis can be helpful for further treatment. Many works are carried out for accurate diagnosis and always have some limitations in accurate predictions. In this work, an efficient algorithm is proposed for the accurate diagnosis of cervical cancer. A meta-heuristic called artificial Jellyfish search optimizer (JS) algorithm is combined with artificial neural network (ANN) to tackle this problem. The proposed algorithm is called JellyfishSearch_ANN and is employed to classify the cervical cancer dataset with four type of targets based on the examination. The JellyfishSearch_ANN provides outstanding results among other classifiers taken for comparison and mainly its classification accuracy is found to be above 98.87% for all targets.

INDEX TERMS Artificial neural network, Artificial Jellyfish search optimizer, Cervical cancer, Metaheuristic optimization.

I. INTRODUCTION

One among the gynecological cancer is the cervical cancer which occurs in the reproductive organ of the women. Its different sorts are ovarian cancer, uterine cancers, vaginal cancers and others. The lower part of uterus that ends with vagina is the cervix. When the DNA mutations takes place in the healthy cells of cervix, this mostly ends with cancer in cervix. There is a possibility of spreading cancer to various organs that are nearby such as vagina, lungs, lever and others. Mostly middle aged women are highly prone to this disease. It is of various types namely adenocarcinoma, squamous cell carcinoma, and adenosquamous carcinoma. These may spread in four different stages as stage1, stage2, stage3 and stage4. This disease is cause due to the sexual transmission of human papillomavirus (HPV) from an infected person to a healthy [1]. As the symptoms are hard to diagnose at the early stage, hence most of the women become a victim for this disease.

Every female should proceed with a normal checkup at a right period of time but the symptoms are hard to analyze. This may be averted by a means of PAP smear screening technique and with the help of getting HPV vaccine. This cancer may be prevented by a correct analysis with proper assistance. This is one of the preventable and treatable if identified early and handled effectively [2, 3]. The proposed approach, JellyfishSearch_ANN handles this purpose.

A number of works carried out on cervical cancer are mentioned below. In [4], the strategies which include filters and wrappers have been used to choose the attributes from the dataset utilized in that work. The lacking and imbalance information are dealt with the use of oversampling, under sampling and other sampling strategies. Among the following classifiers like logistic regression, support vector machine (SVM), neural networks (NN), the Decision tree classifier has yielded 97.5%. The attributes which include patient_age, smoking, hormonal_contraception,

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Research Article

An Efficient Multilevel Thresholding Scheme for Heart Image Segmentation Using a Hybrid Generalized Adversarial Network

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Most people worldwide, irrespective of their age, are suffering from massive cardiac arrest. To detect heart attacks early, many researchers worked on the clinical datasets collected from different open-source datasets like PubMed and UCI repository. However, most of these datasets have collected nearly 13 to 147 raw attributes in textual format and implemented traditional data mining approaches. Traditional machine learning approaches just analyze the data extracted from the images, but the extraction mechanism is inefficient and it requires more number of resources. The authors of this research article proposed a system that is aimed at predicting heart attacks by integrating the techniques of computer vision and deep learning approaches on the heart images collected from the clinical labs, which are publicly available in the KAGGLE repository. The authors collected live images of the heart by scanning the images through IoT sensors. The primary focus is to enhance the quality and quantity of the heart images by passing through two popular components of GAN. GAN introduces noise in the images and tries to replicate the real-time scenarios. Subsequently, the available and newly created images are segmented by applying a multilevel threshold operation to find the region of interest. This step helps the system to predict the accurate attack rate by considering various factors. Earlier researchers have obtained sound accuracy by generating similar heart images and found the ROI parts of the 2D echo images. The proposed methodology has achieved an accuracy of 97.33% and a 90.97% true-positive rate. The reason for selecting the computed tomography (CT-SCAN) images is due to the gray scale images giving more reliable information at a low computational cost.

1. Introduction

Using the CNN, the entire image is processed which requires lot of resources and needs high-end GPU which makes the deployment of the model expensive. Image segmentation can find the region of interest by clustering the pixels with homogenous labels. Since working with only fewer parts of the images reduces the resources, it is more efficient than the CNN. This process also enhances the granularity of the images by focusing only on the characteristics that are

Research Article

An Intelligent Approach of Intrusion Detection in Mobile Crowd Sourcing Systems in the Context of IoT Based SMART City

MVV Prasad Kantipudi, Rajanikanth Aluvalu & Suresh Velamuri

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ABSTRACT

The recent era of pervasive computing has evolved with various applications and has ground-breaking realities in mobile crowdsourcing (MCS). Multiple attempts have been devoted to integrating MCS with IoT-based smart cities where crowdsensing has played a crucial role in the recent past. Despite having potential features, MCS devices

lack efficiency when security aspects are concerned. The current security approaches exercised in MCS operations imply limited features and are not intelligent enough to

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WOGRU-IDS — An intelligent intrusion detection system for IoT assisted Wireless Sensor Networks

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Highlights

- A Novel and Hybrid Learning Model based WSN-IOT-IDS (WOGRU-WSN-IDS) has been proposed. The whale algorithm optimises GRU network hyperparameters, solving classification issues and high-speed detection.
- This paper employs WSN-DS datasets for experiments and a learning model-based IDS system for comparison.
- A scalable, high accurate, high speed WOGRU IDS System is introduced to handle the larger WSN datasets.

Abstract

One of the key mechanisms of the current electronic and wireless frameworks is the assistance of Wireless Sensor Networks (WSN) in Internet of Things (IoT) networks. A WSN typically consists of multipurpose sensor hubs for data sensing, processing, and communication. These networks are more suited to conveying medical data from various geographical regions and sending private medical data to the network owner. However, the worry about various attacks on health care data normally grows daily. These assaults could quickly have adverse impacts on the WSN-IoT (Internet of Things) nodes. Additionally, the low detection rate, significant processing overhead, and resource limitations of current intrusion detection systems all contribute to an increase in false alarm rates when trying to identify various attacks. The unique Whale Optimized Gate Recurrent Unit (WOGRU) Intrusion Detection System (IDS) for WSN-IoT networks is proposed in this research in light of the aforementioned issues in order to effectively identify various attacks. The whale algorithm was used in the proposed framework to tune the hyperparameters of the deep long short-term memory in order to achieve low computational overhead and great performance. Last but not least, validations are carried out using the WSN-DS dataset, and the performance of the suggested work is evaluated using the parameters accuracy, recall, precision, specificity, and F1-score. Additionally, the comparison study was conducted using the current frameworks. The data demonstrates that the suggested framework had an average performance of 99.85 percent for the detection of flooding, scheduling, black hole, and gray hole attacks.

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Review Article

A Review on Machine Learning Strategies for Real-World Engineering Applications

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Huge amounts of data are circulating in the digital world in the era of the Industry 5.0 revolution. Machine learning is experiencing success in several sectors such as intelligent control, decision making, speech recognition, natural language processing, computer graphics, and computer vision, despite the requirement to analyze and interpret data. Due to their amazing performance, Deep Learning and Machine Learning Techniques have recently become extensively recognized and implemented by a variety of real-time engineering applications. Knowledge of machine learning is essential for designing automated and intelligent applications that can handle data in fields such as health, cyber-security, and intelligent transportation systems. There are a range of strategies in the field of machine learning, including reinforcement learning, semi-supervised, unsupervised, and supervised algorithms. This study provides a complete study of managing real-time engineering applications using machine learning, which will improve an application's capabilities and intelligence. This work adds to the understanding of the applicability of various machine learning approaches in real-world applications such as cyber security, healthcare, and intelligent transportation systems. This study highlights the research objectives and obstacles that Machine Learning approaches encounter while managing real-world applications. This study will act as a reference point for both industry professionals and academics, and from a technical standpoint, it will serve as a benchmark for decision-makers on a range of application domains and real-world scenarios.

1. Introduction

1.1. Machine Learning Evolution. In this digital era, the data source is becoming part of many things around us, and digital recording [1, 2] is a normal routine that is creating bulk amounts of data from real-time engineering applications. This data can be unstructured, semi-structured, and structured. In a variety of domains, intelligent applications can be built using the insights extracted from this data. For example, as in [3] author used cyber-security data for extracting insights and use those insights for building intelligent application for cyber-security which is automated and driven by data. In the article [1], the author uses mobile data for extracting insights and uses those insights for building an intelligent smart application which is aware of context. Real-time engineering applications are based on tools and techniques for managing the data and having the capability for useful knowledge or insight extraction in an intelligent and timely fashion.

sensors

MDPI

Article

BENS—B5G: Blockchain-Enabled Network Slicing in 5G and Beyond-5G (B5G) Networks

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Abstract: Fifth-generation (5G) technology is anticipated to allow a slew of novel applications across a variety of industries. The wireless communication of the 5G and Beyond-5G (B5G) networks will accommodate a wide variety of services and user expectations, including intense end-user connectivity, sub-1 ms delay, and a transmission rate of 100 Gbps. Network slicing is envisioned as an appropriate technique that can meet these disparate requirements. The intrinsic qualities of a blockchain, which has lately acquired prominence, mean that it is critical for the 5G network and B5G networks. In particular, the incorporation of blockchain technology into B5G enables the network to effectively monitor and control resource utilization and sharing. Using blockchain technology, a network-slicing architecture referred to as the Blockchain Consensus Framework is introduced that allows resource providers to dynamically contract resources, especially the radio access network (RAN) schedule, to guarantee that their end-to-end services are effortlessly executed. The core of our methodology is comprehensive service procurement, which offers the fine-grained adaptive allocation of resources through a blockchain-based consensus mechanism. Our objective is to have Primary User—Secondary User (PU—SU) interactions with a variety of services, while minimizing the operation and maintenance costs of the 5G service providers. A Blockchain-Enabled Network Slicing Model (BENS), which is a learning-based algorithm, is incorporated to handle the spectrum resource allocation in a sophisticate manner. The performance and inferences of the proposed work are analyzed in detail.

Keywords: blockchain; network slicing; 5G communications; radio access network; 5G-CORE network functions; beyond-5G

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1. Introduction

As a result of the Internet of Things era, new time- and mission-critical applications that incorporate 5G or B5G have been created for every sector of human activity. These end-to-end applications are organized using a series of network services [1]. As a result, infrastructure operators must bring computational capabilities closer to end-users to meet the delay requirements of cloud computing. Wireless data traffic will surge in the coming years as the number of mobile users and the wide range of bandwidth-hungry apps they use increase dramatically. Next-generation (5G) and 5G wireless communication networks will support a broader communication ecosystem, including the Internet of Things (IoT) and Internet of Vehicles (IoV) [2]. The 5G and beyond 5G wireless communications are expected to constitute the foundation for several new applications to enable this progress. Customer's needs for applications have a wide range of complexity and customers will want to be met with 5G and beyond wireless communications. Some vertical sectors, such as industrial automation control systems and the Internet of Vehicles, need

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Research Article

COCO: Coherent Consensus Schema For Dynamic Spectrum Allocation For 5G

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Numerous wireless technologies have been integrated to provide 5th generation (5G) communication networks capable of delivering mission-critical applications and services. Despite considerable developments in a variety of supporting technologies, next-generation cellular deployments may still face severe bandwidth constraints as a result of inefficient radio spectrum use. To this end, a variety of appropriate frameworks have recently emerged that all aid mobile network operators (MNOs) in making effective use of the abundant frequency bands that other incumbents reserve for their own use. The proposed COCO model for Dynamic Spectrum Allocation (DSA) has 2 functionalities such as 1. Coherent PU-SU packet acceptance algorithm for Secondary User (SU) in DSA. 2. Consensus Algorithm for PU-SU Channel Reservation in DSA. To enable a 5G service with one-millisecond latency, interconnection ports between operators are expected to be required at every base station, which would have a significant influence on the topological structure of the core network. Additionally, just one radio network infrastructure would need to be created, which all operators would then be able to use. We allow change of PU SU characteristics to satisfy the needs of new services. These modifications are accomplished via the use of Coherent and Consensus Algorithms that regulate PU and SU through negotiation and allocation procedures. Our primary objective was to decrease interference, handoff latency, and the chance of blocking. In this paper, we describe our idea for employing COCO Model to address the issues of spectrum mobility, sharing, and handoff for Cognitive Radio Networks in 5G.

1. Introduction

In order to meet the technical requirements for 5G, the sub 1 ms latency rate must be achieved. Content must be supplied from a location near to the user's device if a delay time of less than 1 millisecond is required. In order to provide a service with such low latency, content must be placed extremely near to the client, potentially at the base of every cell, including the numerous tiny cells that are expected to be important in achieving densification needs [1].To enable a 5G service with one millisecond latency, interconnection ports between operators are expected to be required at every base station, which would have a significant influence on the topological structure of the core network [2]. Additionally, just one radio network infrastructure would need to be created, which all operators would then be able to use.

Figure 1 illustrates the "overlay distribution" strategy by radio regulating bodies, which allows wide access to the majority of the frequency band, even if the frequency band is authorized for a certain application. Uncoordinated use of spectrum in both the time and frequency domains can be achieved by using the overlay information exchange. Techniques are used to disperse the generated signal across a wide range of frequencies so that existing licensed radio equipment does not detect an unacceptable level of power [3]. Examples of these approaches include frequency hopping, Multiplexing, and Ultra-Wide Band. This kind of

sensors

MDPI

Article

Elite-CAM: An Elite Channel Allocation and Mapping for Policy Engine over Cognitive Radio Technology in 5G

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Abstract: The spectrum allocation in any auctioned wireless service primarily depends upon the necessity and the usage of licensed primary users (PUs) of a certain band of frequencies. These frequencies are utilized by the PUs as per their needs and requirements. When the allocated spectrum is not being utilized in the full efficient manner, the unused spectrum is treated by the PUs as white space without believing much in the concept of spectrum scarcity. There are techniques invented and incorporated by many researchers, such as cognitive radio technology, which involves software-defined radio with reconfigurable antennas tuned to particular frequencies at different times. Cognitive radio (CR) technology realizes the logic of the utility factor of the PUs and the requirements of the secondary users (SU) who are in queue to utilize the unused spectrum, which is the white space. The CR technology is enriched with different frequency allocation engines and with different strategies in different parts of the world, complying with the regulatory standards of the FCC and ITU. Based on the frequency allocation made globally, the existing CR technology understands the nuances of static and dynamic spectrum allocation and also embraces the intelligence in time allocation by scheduling the SUs whenever the PUs are not using the spectrum, and when the PUs pitch in the SUs have to leave the band without time. This paper identifies a few of the research gaps existing in the earlier literature. The behavioral aspects of the PUs and SUs have been analyzed for a period of 90 days with some specific spectrum ranges of usage in India. The communal habits of utilizing the spectrum, not utilizing the spectrum as white space, different time zones, the requisites of the SUs, the necessity of the applications, and the improvement of the utility factor of the entire spectrum have been considered along with static and dynamic spectrum usage, the development of the spectrum policy engine aligned with cooperative and opportunistic spectrum sensing, and access techniques indulging in artificial intelligence (AI). This will lead to fine-tuning the PU and SU channel mapping without being hindered by predefined policies. We identify the cognitive radio transmitter and receiver parameters, and resort to the same in a proposed channel adaption algorithm. We also analyze the white spaces offered by spectrum ranges of VHF, GSM-900, and GSM-1800 by a real-time survey with a spectrum analyzer. The identified parameters and white spaces are mapped with the help of a swotting algorithm. A sample policy has been stated for ISM band 2.4 GHz where such policies can be excited in a policy server. The policy engine is suggested to be configured over the 5G CORE spectrum management function.

Keywords: cognitive radio; wireless communications; 5G CORE; spectrum allocation; 5G communications

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1. Introduction

The 5G wireless structure desires to support varied service models, different delays, and reliable demands. The 5G broadband wireless communication results in several issues

Table of Content

Open Access ARTICLE

Effective Return Rate Prediction of Blockchain Financial Products Using Machine Learning

K. Kalyani[1], Velmurugan Subbiah Parvathy[2], Hikmat A. M. Abdeljaber[3], T. Satyanarayana Murthy[4], Srijana Acharya[5], Gyanendra Prasad Joshi[6], Sung Won Kim[7,*]

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An efficient diabetes prediction system for better diagnosis

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Abstract

An unreasonable increase of glucose in blood results in diabetes. In recent times this problem is often seen in many people around the world. Having an efficient medical diagnosis of diabetic prevention is essential. In this context, healthcare professionals have come up with different solutions, but none of them have taken shape. Considering these facts, we have proposed an integrated diabetic prediction system with the inclusions of un-supervised K-means clustering and naive Bayes classification. In this context, random attribute selection is used as the initial centroid selection method for K-means clustering. Significant work is compared with traditional classification algorithms like naive Bayes, SVM, etc., in terms of accuracy along with additional performance parameters like sensitivity, specificity, precision, and F-measure. As a result, it is determined that the proposed algorithm with 99.42%, which is higher than any other recently proposed classification technique, is achieved.

Keywords

diabetes mellitus, metabolic, knowledge-based DSS, PIMA Indian Heritage, WEKA

Previous Article Next Article

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A Framework for Intelligent Traffic Control System

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Abstract

Recently, traffic congestion has been among the significant problems encountered by many large cities worldwide. The reasons for the traffic congestion are the hasty increase of motor vehicles and inadequate roadways to accommodate a large number of vehicles. Many researchers find the traffic density by applying edge detection (ED), moving object detection (MOD), and frame differencing techniques separately. However, the edge detection method detects the edges for static images and the MOD method finds the traffic density when vehicles are moving. Actually, in real-time, when the red signal is on a traffic junction, the vehicles are in an idle state; this situation is better to apply the ED method. When the green signal is on, vehicles immediately start moving; this situation is best suitable for applying the MOD method to find the real-time traffic density. This paper illustrates a novel technique named Edge Detection and Moving Object Detection (EDMOD) algorithm, which uses ED and MOD approaches to find the real-time area-wide density of the traffic at the traffic light junction by dividing the Region of Interest (ROI) into two regions. It uses ED in region1 and MOD in region2.

Keywords

Edge Detection, Image processing, Moving Object Detection, Traffic density.

Reference

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International Journal of Online Pedagogy and Course Design

Insights on Implications of Cognitive Computing in Leveraging Online Education Systems

Authors: Mahesh S. Raisinghani, Rajanikanth Aluvalu, MVV Prasad Kantipudi, Uma Maheswari V. Authors Info & Claims

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Abstract

Cognitive computing offers a good range of technological platforms that enhance the performance of online learning systems and is meant for assisting both instructors as well as students in leveraging the delivery of enriched content. In comparison to conventional e-learning systems, the inclusion of

result, natural
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Research Article

Multipath Transmission Control Protocol for Live Virtual Machine Migration in the Cloud Environment

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For mobile cloud computing (MCC), a local virtual machine- (VM-) based cloudlet is proposed to improve the performance of real-time resource-intensive mobile applications. When a mobile device (MD) discovers a cloudlet nearby, it takes some time to build up a virtual machine (VM) inside the cloudlet before data offloading from the MD to the VM can begin. Live virtual machine migration refers to the process of transferring a running Virtual Machine (VM) from one host to another without interrupting its state. Theoretically, live migration process must not render the instance being migrated unavailable during its execution. However, in practice, there is always a service downtime associated with the process. This paper focuses on addressing the need to reduce the service downtime in case of live VM migration in cloud and providing a solution by implementing and optimizing the multipath transmission control protocol (MPTCP) ability within an Infrastructure as a service (IaaS) cloud to increase the efficiency of live migration. We have also introduced an algorithm, the α-best fit algorithm, to optimize the usage of bandwidth and to effectively streamline the MPTCP performance.

1. Introduction

A virtual machine (VM) refers to an entity that does not exist physically, but is hosted on a hypervisor, and yet has all the capabilities of an equivalent physical machine [1]. This virtualization gives an added advantage in the form of the ability to migrate a VM from one host machine to another. Virtual machine migration may be done in the cloud for several reasons including load balancing and energy usage optimization. When a VM is used to handle data traffic within a cloud, a relatively freer host (destination host) can be chosen to migrate it to, as an attempt to relieve the load on the source host. Similarly, energy optimization within the cloud can be done by shutting off the nodes which do not host any occupied VMs [2].

In datacenter virtualization, live migration is a crucial technology and feature. With live migration, VMs can be transferred from one physical host to another with little to no impact on the availability of running applications. This ensures that running applications are not harmed by any physical server failures, significantly improving service availability. The TCP/IP protocol is used to send live migration communications via the Ethernet network that connects the cluster servers. The content that needs be migrated is mostly the CPU cache, memory, and buffers; however, the memory content takes up the majority of the time. The content of the CPU cache and buffers is almost insignificant in comparison to the RAM content, which is what most authors assume in live migration modeling.

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Driver Drowsiness Prediction Based on Multiple Aspects Using Image Processing Techniques

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ABSTRACT The majority of the accidents were happening perpetually due to driver drowsiness over the decades. Automation has been playing key role in many fields to provide conformity and improve the quality of life of the users. Though various drowsiness detection systems have been developed during last decade based on many factors, still the systems were demanding an improvement in terms of efficiency, accuracy, cost, speed, and availability, etc. In this paper, proposed an integrated approach depends on the Eye and mouth closure status (PERCLOS) along with the calculation of the new proposed vector FAR (Facial Aspect Ratio) similarly to EAR and MAR. This helps to find the status of the closed eyes or opened mouth like yawning, and any frame finds that has hand gestures like nodding or covering opened mouth with hand as innate nature of humans when trying to control the sleepiness. The system also integrated the methods and textural-based gradient patterns to find the driver's face in various directions identify the sunglasses on the driver's face and the scenarios like hands-on eyes or mouth while nodding or yawning were also recognized and addressed. The proposed work tested on datasets such as NTHU-DDD, YawDD, and a proposed dataset EMOCDS (Eye and Mouth Open Close Data Set) and proved better in terms of accuracy and provides results in general by considering various circumstances.

INDEX TERMS Eye aspect ratio (EAR), mouth aspect ratio (MAR), face aspect ratio (FAR), advanced driver movement tracking system, spatio-temporal interest points, eye gaze tracking, deep neural networks.

I. INTRODUCTION

A large number of people across the world want to buy vehicles. It is noteworthy that the menace of road accidents is also increasing rapidly with the increase in the number of vehicles plying on the roads. The number of road accidents is very high in countries having highly crowded streets and roads. The National Crime Records Bureau (NCRB) conducted a survey and reported that around 0.13 million lives were lost due to road accidents in India in the year 2020 alone [1]. This represents the foremost cause of deaths worldwide. The average mortality is high in the middle-income countries compared to the low-income countries, which is an alarming condition to think towards the hitch. The World Health Organization (WHO) has published an article that pointed out that the risk factors leading to accidents are speeding, intoxicated driver, distracted driving, etc. [2]. Almost all of these factors reveal that most road accidents are happening due to the carelessness of the driver, and the negligence in following the traffic rules as well as the safety precautions. Drowsiness may occur due to lack of sleep or continuous driving at night or both, ultimately making the vehicle driver tired and diverted from the concentration on driving. In the transportation industry, where the bus and truck drivers drive overnight, it is very common for them to fall asleep, particularly in the wee hours, due to exhaustion, while the vehicle is in motion. The circumstances mentioned above demand that people get alerted to avoid these situations to save many previous lives.

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Review Article

Autonomous Vehicles and Intelligent Automation: Applications, Challenges, and Opportunities

Gourav Bathla,[1] **Kishor Bhadane**,[2] **Rahul Kumar Singh**,[1] **Rajneesh Kumar**,[3] **Rajanikanth Aluvalu**,[4] **Rajalakshmi Krishnamurthi**,[5] **Adarsh Kumar**,[1] **R. N Thakur**,[6] **and Shakila Basheer**[7]

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Intelligent Automation (IA) in automobiles combines robotic process automation and artificial intelligence, allowing digital transformation in autonomous vehicles. IA can completely replace humans with automation with better safety and intelligent movement of vehicles. This work surveys those recent methodologies and their comparative analysis, which use artificial intelligence, machine learning, and IoT in autonomous vehicles. With the shift from manual to automation, there is a need to understand risk mitigation technologies. Thus, this work surveys the safety standards and challenges associated with autonomous vehicles in context of object detection, cybersecurity, and V2X privacy. Additionally, the conceptual autonomous technology risks and benefits are listed to study the consideration of artificial intelligence as an essential factor in handling futuristic vehicles. Researchers and organizations are innovating efficient tools and frameworks for autonomous vehicles. In this survey, in-depth analysis of design techniques of intelligent tools and frameworks for AI and IoT-based autonomous vehicles was conducted. Furthermore, autonomous electric vehicle functionality is also covered with its applications. The real-life applications of autonomous truck, bus, car, shuttle, helicopter, rover, and underground vehicles in various countries and organizations are elaborated. Furthermore, the applications of autonomous vehicles in the supply chain management and manufacturing industry are included in this survey. The advancements in autonomous vehicles technology using machine learning, deep learning, reinforcement learning, statistical techniques, and IoT are presented with comparative analysis. The important future directions are offered in order to indicate areas of potential study that may be carried out in order to enhance autonomous cars in the future.

1. Introduction

Autonomous vehicles (AVs) and associated technologies have rapidly gained the attention of the research community. AV utilizes sensorial technologies such as computer vision, odometry, GPS, laser lights, sensors, and a mapping system to navigate. These technologies can be used to determine environments and locations and recognize the suitable routes amid obstacles and signage [1, 2]. AVs are supposed to minimize vehicle accidents, enhance the flow of traffic and movability, reduce the utilization of fuel, be free from driving, and facilitate business operation and transportation [3–6]. Despite the massive potential advantages, there are many unsolved safety, security, legal and regulatory, social,

Concurrency and Computation
Practice and Experience

RESEARCH ARTICLE

PGWO-AVS-RDA: An intelligent optimization and clustering based load balancing model in cloud

Raghavender Reddy Kothi Laxman, Amit Lathigara, Rajanikanth Aluvalu, Uma Maheswari Viswanadhula

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Research Article

Hybrid Optimized GRU-ECNN Models for Gait Recognition with Wearable IOT Devices

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With the advent of the Internet of Things (IoT), human-assistive technologies in healthcare services have reached the peak of their application in terms of diagnosis and treatment process. These devices must be aware of human movements to provide better aid in clinical applications as well as the user's daily activities. In this context, real-time gait analysis remains to be key catalyst for developing intelligent assistive devices. In addition to machine and deep learning algorithms, gait recognition systems have significantly improved in terms of high accuracy recognition. However, most of the existing models are focused on improving gait recognition while ignoring the computational overhead that affects the accuracy of detection and even remains unsuitable for real-time implementation. In this research paper, we proposed a hybrid gated recurrent unit (GRU) based on BAT-inspired extreme convolutional networks (BAT-ECN) for the effective recognition of human activities using gait data. The gait data are collected by implanting the wearable Internet of Things (WIoT) devices invasively. Then, a novel GRU and ECN networks are employed to extract the spatio-temporal features which are then used for classification to realize gait recognition. Extensive and comprehensive experimentations have been carried out to evaluate the proposed model using real-time datasets and also other benchmarks such as whuGait and OU-ISIR datasets. To prove the excellence of the proposed learning model, we have compared the model's performance with the other existing hybrid models. Results demonstrate that the proposed model has outperformed the other learning models in terms of high gait classification and less computational overhead.

1. Introduction

In recent years, activity recognition (AR) has witnessed exponential growth in in different domains such as healthcare [1], home automation [2], and even criminal activity detection. These methods are adopted aiming both at improving the quality of living and allowing people to stay without any support from others [3]. In the health care system, these AR systems are burgeoning technology mainly designed to detect the patient's mobility in rehabilitation therapy and to monitor physical performance after undergoing treatment with great expectations of improving his/her living quality as much as possible.

However, activity data remain more complex, which paid the way for the open research to design the intelligent human activity recognition system. Initially, simple binary sensors are used to design the recognition system [4, 5]. More recently, the Internet of Things (IoT) has been used to collect and analyze human activities and gestures [6, 7]. These devices are used as wearable devices that can be continuously used indoors or outdoors while ensuring the privacy and security of the data.

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Review

Bio-Signals in Medical Applications and Challenges Using Artificial Intelligence

Mudrakola Swapna [1], Uma Maheswari Viswanadhula [2], Rajanikanth Aluvalu [3], Vijayakumar Vardharajan [4,*] and Ketan Kotecha [5,*]

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Abstract: Artificial Intelligence (AI) has broadly connected the medical field at various levels of diagnosis based on the congruous data generated. Different types of bio-signal can be used to monitor a patient's condition and in decision making. Medical equipment uses signals to communicate information to care staff. AI algorithms and approaches will help to predict health problems and check the health status of organs, while AI prediction, classification, and regression algorithms are helping the medical industry to protect from health hazards. The early prediction and detection of health conditions will guide people to stay healthy. This paper represents the scope of bio-signals using AI in the medical area. It will illustrate possible case studies relevant to bio-signals generated through IoT sensors. The bio-signals that retrospectively occur are discussed, and the new challenges of medical diagnosis using bio-signals are identified.

Keywords: artificial intelligence; signal processing; bio-medical signal processing; smart health devices; sensors; bio-signals

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1. Introduction

Artificial Intelligence (AI) was born from the idea of two great scientists—Herbert Simon and Allen Newell. In 1958, they proposed that various interdisciplinary departments and professional sectors cooperate and develop science and its applications [1]. AI started its journey from mathematical logic, knowledge, and reasoning concepts and became a branch of Computer Science by serving all other disciplines as per their needs and by producing useful products. The concepts of AI are built on knowledge base, algorithm design, and expert systems, and they include features such as Problem Solving, Perception, Natural Language Understanding, Logic Reasoning, Neural Networks, Machine Learning, and Learning. AI has emerged alongside new technologies in education, industry, finance, travel, automated industry, and the media sectors [2,3].

AI has also become a mandatory and intelligent approach to deal with issues in the healthcare industry. AI can be defined differently in different areas, and the best way to address this is for machine intelligence to imitate human intelligence. The biggest challenge in healthcare is that doctors cannot spend enough time on data analysis due to excessive workload. Data scientists can help in the processing and analysis of data, and in comparing the data of various diseases. A patient's medical records can be analyzed, and patterns can be detected and used to characterize the behavior of the disease. AI healthcare researchers are currently undertaking studies worldwide. Countries such as the USA, the UK, and

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Research Article

Performance Evaluation of SeisTutor Using Cognitive Intelligence-Based "Kirkpatrick Model"

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The classroom learning environment facilitates human tutors to interact with every learner and get the opportunity to understand the learner's psychology and then provide learning material (access learner prior knowledge and well align the learning material as per learner requirement) to them accordingly. Implementing this cognitive intelligence in intelligent tutoring system is quite tricky. This research has focused on mimicking human tutor cognitive intelligence in the computer-aided system of offering an exclusive curriculum to the learners. The prime focus of this research article is to evaluate the proposed SeisTutor using Kirkpatrick's four-phase evaluation model. Experimental results depicting the enhanced learning gain through intelligence incorporated SeisTutor as against the intelligence absence are demonstrated.

1. Introduction

Understanding "Seismic Interpretation" has been considered as important and valuable for petroleum exploration because it provides a sophisticated way of delineating the Earth's subsurface (in the form of seismic snap), understanding the seismic snaps, and then concluding the presence of hydrocarbon or not. This technique can be applied again and again while capturing, analyzing, interpreting, and predicting the presence of hydrocarbon amassing [1].

The interpretation of seismic snaps is a challenging task for a seismologist. Seismologists utilize their expertise to interpret seismic images. However, one possibility is that different geologists interpret the same seismic snap differently during interpretation. This vagueness is due to a lack of thumb rules—the interpretation expertise gained by experience over past years. Thus, novice geologists in this field took many years to gain these expertises. It will be paramount for them if these skills are offered to them at the beginning of their interpretation career. To accomplish this, exploratory learning would be the best strategy for learning. In this learning, an individual has control over the learning process. It means the learner chooses his/her topics, level of difficulty, learning pace, and so forth [2]. To effectively meet this learner-centric requirement, an intelligent tutoring system can offer personalized learning experiences to learners. Intelligent tutoring system (ITS) is an artificial intelligence (AI) technique that provides the learner exclusive learning material, aligned and gathered as per learner grasping ability and preferred media of learning.

SeisTutor has been developed for learning "Seismic Data Interpretation" as a subject domain of this research. This research aims to provide pastoral care to learners by cost-effectively offering one-to-one, customized learning material. SeisTutor delivers a personalized learning environment. It brings personalization in identifying tutoring strategy (based on pretest (learning style test and domain knowledge test)), exclusive curriculum design, and observation of learner psychological state of mind during learning sessions. The feature of personalization is built on many aspects, such

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Research Article

An Effective Bootstrapping Framework for Web Services Discovery Using Trigram Approach

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ff eb serAices are progressiAelq being used to coHprehend serAicexoriented architectures. ff eb serAices QacilitQte the integration oQ applications and siHpliQ interoperabilitq. 0 dditionallqf it assists in ffirapping accessible applications in order Qor deAelopers to access theH using standard languages and protocols. We user Qaces a di' cult challenge in selecting the appropriate serAice in accordance ffiith the user reGuest as the behaAior oQthe participating serAice a(ects the oAerall perQorHance in discoAerqf selectionf and coHposition. 0 s a resultf it is critical to select a highxGualitq serAice proAider Qor these actiAities. k) isting approaches relq on nonQunctional Gualities Qor discoAerq and selectionf but the user cannot alffiaqs relq on these Qeaturesf and these [oS Aalues cannot be used to deterHine the user]s or Gualitq perspectiAe. 0 dditionallqf the user indicates an interest in a highxGualitq serAice based on Gualitq attributes or serAice ffiith a good reputation throughout the selection process rather than a neffilq registered serAice. 0 s a resultf a proper bootstrapping HechanisH is reGuired to eAaluate neffilq registered serAices prior to their use bq serAice reGuestors. Wis paper proposes a noAel bootstrapping HechanisH. We contribution oQthis paper inAolAes XaI a Hethod Qor eAaluating the Gualitq oQserAice X{ oSI bq Qocusing on perQorHancexrelated indicators such as response tiHef e) ecution tiHef throughputf latencqf and dependabilitq; XbI a Hethodologq Qor eAaluating the [ok attributes based on user reAieffis that taTh into account both attributes and opinions; XcI bootstrap the neffilq registered serAice based on Gualitq oQserAice and Gualitq oQe) perience; and XdI building a recoHHender sqsteH that suggests the topxrated serAice Qor coHposition. We eAaluation results are used to augHent currentlq aAailable online serAices bq proAiding upxtoxdate Gualitq oQserAice and Gualitq oQe) perience attributes Qor discoAerqf selectionf and coHposition.

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ORIGINAL RESEARCH article

Front. Public Health, 07 June 2022

Sec. Digital Public Health

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A Neural Network and Optimization Based Lung Cancer Detection System in CT Images

Chapala Venkatesh[1], Kadiyala Ramana (https://www.frontiersin.org/people/u/1464826)[2*], Siva Yamini Lakkisetty[1], Shahab S. Band[3*], Shweta Agarwal[4] and Amir Mosavi[5,6,7*]

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One of the most common causes of death from cancer for both women and men is lung cancer. Lung nodules are critical for the screening of cancer and early recognition permits treatment and enhances the rate of rehabilitation in patients. Although a lot of work is being done in this area, an increase in accuracy is still required to swell patient persistence rate. However, traditional systems do not segment cancer cells of different forms

1.

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DOIs:10.2015/IJIRMF/202202031 --:-- Research Paper

Novel Utilization and Applications of Rice Husk as Green and Sustainable Biomass

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Abstract: *Research on agricultural wastes management is state of the art and desirable subject in engineering subcategories. Recent developments in the reuse of agricultural residues/resources have led to environmental sustainability and cleaner technology emphasizing the utilization of natural resources. As a staple food for much of the world, rice production is widespread and its annual production generates huge quantities of husk (~1.5 × 10^{11} kg). Rice husk is easily collected and cheap, so it has always had some use as an energy source for small applications, and in recent years a number of rice husk derived products have been developed and is considered as one of the abundant and valuable agro-based residues. It contains a combination of cellulose, hemicellulose, and lignin, along with appreciable amounts of silica and inorganic components (ash). Rice husk pellets represent an alternative to diesel oil and coal for small scale electrical power generation. It is one of the abundant lignocellulosic biomass with potential as a feedstock for bioethanol production. Because of its high specific surface area, it has proven to be a potential low-cost material in the applications of water treatment and building*

2.

Chemical Data Collections
Volume 37, February 2022, 100820

Thermodynamic properties of active pharmaceutical ingredients that are of interest in COVID-19

Harsha Nagar [a], Dhiraj Ingle [b], Chandan Kumar Munagala [b], Aman Kumar Kesari [b], Vineet Aniya [b]

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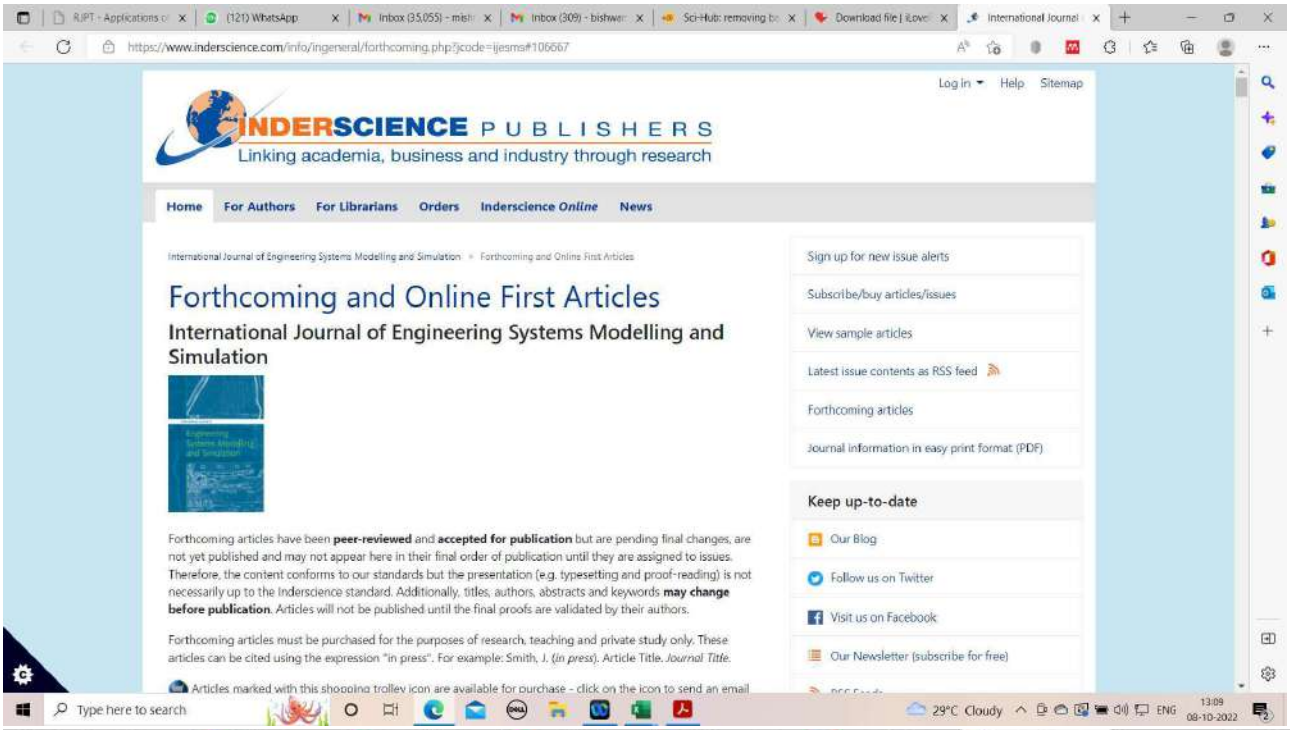
Highlights

- Thermodynamic properties of drugs related to covid-19.
- Pure component properties based on group contribution method.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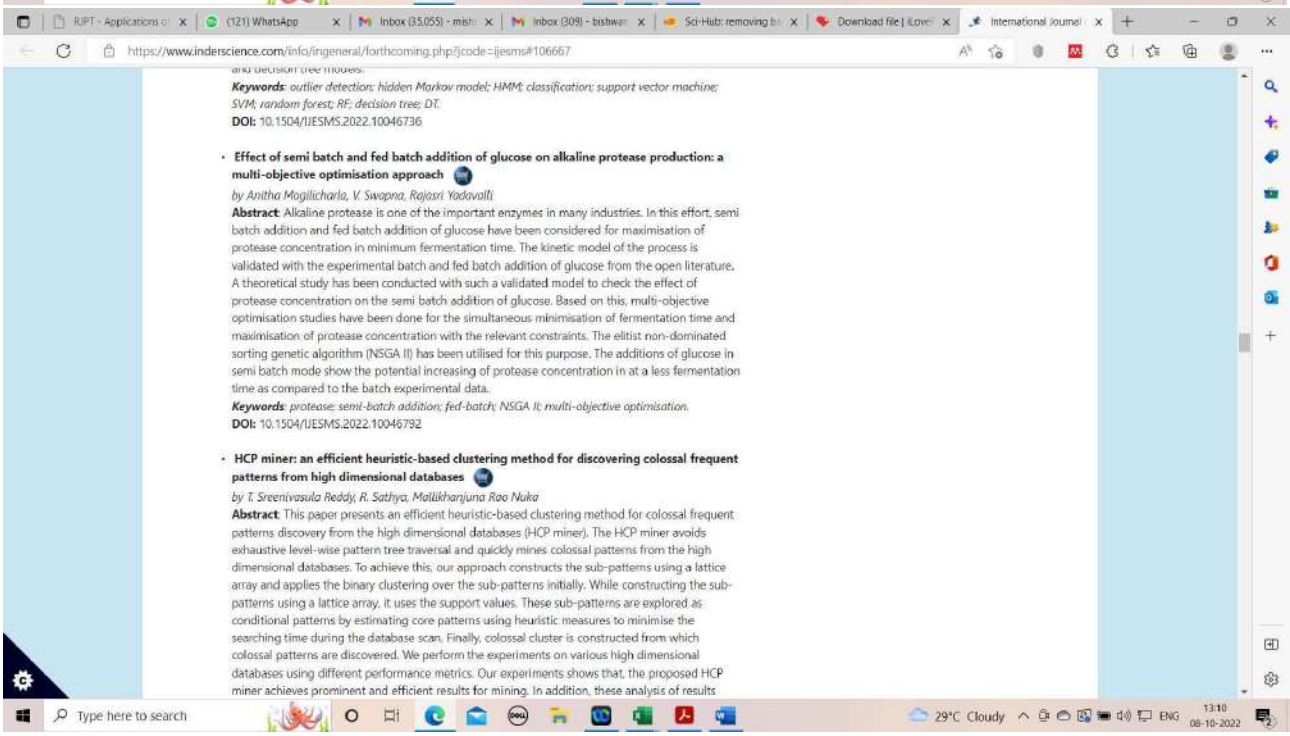
https://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=ijesms#106667
Keywords: outlier detection; hidden Markov model; HMM; classification; support vector machine; SVM; random forest; RF; decision tree; DT.
DOI: 10.1504/IJESMS.2022.10046736
Effect of semi batch and fed batch addition of glucose on alkaline protease production: a multi-objective optimisation approach
by Anitha Mogilicharla, V. Swapna, Rajasri Yadavalli
Abstract: Alkaline protease is one of the important enzymes in many industries. In this effort, semi batch addition and fed batch addition of glucose have been considered for maximisation of protease concentration in minimum fermentation time. The kinetic model of the process is validated with the experimental batch and fed batch addition of glucose from the open literature. A theoretical study has been conducted with such a validated model to check the effect of protease concentration on the semi batch addition of glucose. Based on this, multi-objective optimisation studies have been done for the simultaneous minimisation of fermentation time and maximisation of protease concentration with the relevant constraints. The elitist non-dominated sorting genetic algorithm (NSGA II) has been utilised for this purpose. The additions of glucose in semi batch mode show the potential increasing of protease concentration in at a less fermentation time as compared to the batch experimental data.
Keywords: protease; semi-batch addition; fed-batch; NSGA II; multi-objective optimisation.
DOI: 10.1504/IJESMS.2022.10046792
HCP miner: an efficient heuristic-based clustering method for discovering colossal frequent patterns from high dimensional databases
by T. Sreenivasula Reddy, R. Sathya, Mallikharjuna Rao Nuka
Abstract: This paper presents an efficient heuristic-based clustering method for colossal frequent patterns discovery from the high dimensional databases (HCP miner). The HCP miner avoids exhaustive level-wise pattern tree traversal and quickly mines colossal patterns from the high dimensional databases. To achieve this, our approach constructs the sub-patterns using a lattice array and applies the binary clustering over the sub-patterns initially. While constructing the sub-patterns using a lattice array, it uses the support values. These sub-patterns are explored as conditional patterns by estimating core patterns using heuristic measures to minimise the searching time during the database scan. Finally, colossal cluster is constructed from which colossal patterns are discovered. We perform the experiments on various high dimensional databases using different performance metrics. Our experiments shows that, the proposed HCP miner achieves prominent and efficient results for mining. In addition, these analysis of results
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DATA VISUALIZATION USING MARKER-BASED AUGMENTED REALITY TECHNIQUES

Dr. Chittepu Obula Reddy

Assistant Professor Department of biotechnology Chaitanya Bharathi Institute of Technology, Gandipet, Hydearabad-500075, Telangana state, cobulreddy_biotech@cbit.ac.in

Abstract

Augmented reality is one of the fastest growing technologies in the world today. It has been incorporated in a number of successful applications and is one of the most useful and effective high-end tools for industries like E-learning, E-commerce. Although Augmented Reality is supported by most android phones these days, further improvements in features are required. The research focuses around data visualizations displayed through augmented reality. This approach helped organizations to categorize and organize data in a manner that improved market analysis and economic growth. Capitalizing on this technology further, it would be immensely helpful to educate users about different food items and their nutritional contents. The use of information graphics displayed through Augmented Reality technique would be able to provide a more comprehensive view about the food item under consideration and help users make better lifestyle choices. The visualizations of classification have been obtained in the form of confusion matrix and forwarded to the Unity engine for embedding it with the Augmented Reality application for augmenting the visualizations and displaying 3D views to the end users.

Keywords: Data analysis, Visualization, Augmented reality, Multiclass Classification, OneR classifier

1. Introduction

One of the primary objectives of Data Visualization is to give a clear and quick view of the examination acquired from the datasets. One can undoubtedly separate bits of knowledge to go with quick information-driven choices for the organization's advantage. Most decision-makers do not have a lot of time and would rather look at visual representations of data [B. Marques et al (2019)]. Augmented Reality is where images, such as graphics, alphanumeric, photographs, videos, etc., are superimposed on to the real world. Reality is what we see normally most of the time without any special viewing devices, and it is normally in stereoscopic 3D. If we can see only the artificial added images, as a simulation of reality (a “virtual world”) but not the real world (such as with opaque headsets), that is virtual reality (VR). If we wear AR goggles or AR glasses that are transparent so that we can see the real world through them, but allow additional images to be superimposed which may also be in stereoscopic 3D, that is augmented reality. The application scans the picture received from the phone camera, then the picture is processed by the HOG algorithm, and similar points to the pictures from the camera and the marker images are found. After the successful finding, the application analyzes the rotation and position of the picture and adjusts the animation directly for these points.

2. Literature Survey

Through field research, educators experience new technology of using HoloLens for interactive study purposes. [1]. This technology uses Hololenses, to help to study movements of various body parts used by medical students for study purpose and for correct treatment. [2][3]. S. Howard, et al., fostered an application for including computer generated reality content for most recent training. which worked with a special chance to cooperate to lay out an exploration project creating and upgrading the

REVIEW ARTICLE

Impact of various factors on the stability of biodiesel – a review

Kurapati Rajagopal[1], Y. S. Reddy[1], Chittepu Obula Reddy[2, *]

[1]Department of Physics, [2]Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, Telangana, India.

Received: December 25, 2021; **accepted:** February 3, 2022.

Biodiesel is a class of biofuels as an alternative to petroleum diesel (PD). It is gaining importance as it is environment friendly, renewable, and locally available. The main drawback of biodiesel is its poor storage stability comparing to PD. Many factors including feedstock, temperature, contact with oxygen, water, residual catalyst, alcohol due to incomplete transesterification, the fatty acid profile of biodiesel, and contaminants are related to the instability of biodiesel. Instability occurs in the form of oxidation. Along with elevated temperature, biodiesel oxidation reaches its peak. Identification of the insoluble formed in biodiesel is possible by distortion and absorption of ultrasonic waves. The biodiesel oxidation analysis is taken place by using tools such as Fourier Transform Infrared (FTIR) spectroscopy and Nuclear Magnetic Resonance (NMR) method. The fatty acid profile of biodiesel plays a key role in biodiesel stability together with oxygen and temperature.

Keywords: biodiesel stability; oxidation; fatty acid profile; contaminants; temperature; ultrasonic; analytical tools.

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Introduction

Energy is the primary need of a country for its socio-economic growth. Now, fossil fuels are declining at a drastic rate [1]. Biodiesel is a better substitution for petroleum diesel (PD). Biodiesel is a renewable fuel [2]. It is environment friendly and biodegradable. The main drawback of biodiesel is its poor storage stability that is more susceptible to degradation than it of PD and is a crucial factor to commercialize biodiesel [3].

Biodiesel feedstock

Biodiesel is also a part of biofuels. Biodiesel feedstock is categorized into four generations. The 1st generation biodiesels were produced from oil crops. Most of the biodiesel production cost is due to its feedstock cost. About 350 different oil crops that belong to edible and non-edible are available as feedstocks. The common sources of edible crops include peanut, safflower, corn, rice bran, coconut, olive, castor, milkweed seed, linseed, rapeseed, soybean, palm, and sunflower. The non-edible sources include *Jatropha curcas*, *Pongamia glabra*, *Madhuca indica*, *Salvadora oleoides*, cottonseed oil, Tobacco, *Calophyllum Eruca Sativa Gars*, *inophyllum, terebinth*, fish oil, desert date, Jojoba, neem oil, leather pre-fleshings, apricot seed, *Pistacia chinensis* bunge seed, and rubber seed. The 2nd generation feedstocks belong to energy crops, agricultural remains, and wood residual wastage. Common energy crops for this purpose are *Jatropha*, *Aleurites moluccana*,

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RESEARCH ARTICLE

Applications of Microbial bioflocculants for Environmental remediation: An Overview

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ABSTRACT:
The application of bioflocculants has recently become a promising solution for the treatment of water and wastewater as well as removal of pollutants from environment. Water pollution is the most challenging environmental issue in the developing countries to determine the quality of life. The wastewater from different sources contains suspended solids, organic and inorganic particles, dissolved solids, heavy metals, dyes and other impurities which are harmful to the environment causing major health hazards in human and animals. The use of bioflocculants is advantageous for the control of environmental pollution as they are non- toxic and biodegradable in nature. Moreover, they do not create any secondary pollution. Chemical flocculants being a source of carcinogens can be replaced by bioflocculants which needs to be produced on a large scale. However, commercially viable bioflocculants are yet to be produced and marketed widely. This review intends to present the updated information on microbial bioflocculants and their applications for remediation of pollutants from wastewater. It may bring up the significant issues which can be attempted by future researchers for a better understanding to develop commercially viable, safe, eco-friendly and cost effective bioflocculants using new biotechnological techniques.

KEYWORDS: Bioflocculant, Biodegradable, Eco-Friendly, Flocculation Activity, Wastewater Treatment.

INTRODUCTION:
Industrialization, urbanization and extensive agricultural production are mainly responsible for environmental pollution generating polluted effluents which need to be treated[1-6]. The relevant technologies adopted for the wastewater treatment should be cost effective offering a less processing time and should leave a minimum impact on the environment[7-12]. Coagulation-flocculation is a conventional method for water treatment to remove various dissolved contaminants, suspended solid (SS) particles and emulsified oil from wastewater[13]. The neutralization of repulsive force of colloids occurs during coagulation which causes formation of micro-particles.

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In the next step, the micro-particles aggregate and flocs are formed which are removed effectively through sedimentation[14-17]. During the process of coagulation, fragile flocs are produced leading to breakage and resuspension of flocs[18]. Multivalent metal like alum (Aluminum sulfate) is being used as traditional coagulant in large doses for the efficient removal of turbidity. But, the production of metal hydroxide sludge also causes disposal challenge. There is always concern about the residuals of the metals present in treated water or sludge, which may cause detrimental effects on human health and the environment[19].

Flocculants are being used to solve these problems reducing the usage of traditional coagulants. Sedimentation of the flocs is possible applying proper doses and types of flocculant so that acceptable effluent can be obtained[20]. Sometimes, Al-based cationic inorganic polymer flocculants viz. polyaluminumchloride (PAC), and polyaluminum sulfate and flocculants like polyacrylamide or

High saturation magnetization in $Ni_{0.2}Mn_{0.8}Fe_2O_4$ nanoparticles

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The present work is focused on the synthesis of NiMn ferrite nanoparticles using hydrothermal method. The samples are examined by X-ray diffractometer (XRD), Field emission scanning electron microscope (FESEM), Transmission electron microscope (TEM), Vibrating sample magnetometer (VSM) and LCR controller in order to understand the ferrite structure, crystallite size, surface morphology, grain size, particle size, M-H loop behavior, and the variation of magnetic permeability as a function of frequency and composition. The results indicated that the high saturation magnetization is observed in case of high manganese content. Besides, the permeability versus frequency plots satisfied the Snoke's law.

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Keywords: Nanoparticles, Ferrites, Surface morphology, Magnetic properties

1. Introduction

It is evidenced that the ferrites in bulk as well as nanoform established significant applications in the fields of memory devices, magnetic tapes, microwave devices, photocatalytic, antimicrobial, transformer & inductor cores, antenna, magnetic hyperthermia, electromagnetic shields etc., [1-8]. The efficient of these applications is a dependent of type substituent/dopant, cationic distribution, spinel structure, and kind of synthesis technique [9-14]. It is a known fact that the ferrites will have a general chemical formula: AFe_2O_4 (where 'A' tends to divalent metal ions such as Ni, Mg, Cu, Zn, Mn, etc) [15-17]. It is commonly considered as magnetic spinel structure. These spinels are classified into three types such as normal spinel, inverse spinel, and mixed spinel. This is done based on the degree of inversion (δ) of spinel structure. That is, δ =1 for normal spinel, δ =0 for inverse spinel, and δ=0.25 for mixed spinel [18]. These structures of ferrites vary from bulk to nano. For example, nickel ferrite shows inverse spinel structure in bulk form occupying the nickel ions octahedral and tetrahedral sites equally. On the other hand, the same ferrite reveals the mixed spinel structure in nanoform [18].

The nickel ferrite is extensively studied for various applications in the field of science and technology in bulk and nanoform [18]. Many scientists worked on nickel ferrite to report the structural, electrical, optical, magnetic, microwave, electromagnetic, biomedical etc., properties. For instance, the literature [1-18] shows that several scientists worked on nickel ferrite, and its based bulk, and nanoferrites to investigate the structure, particle size, surface morphology, electrical, dielectric, magnetic, electromagnetic, microwave, and optical properties. Similarly, the PVDF/$NiFe_2O_4$ based electrospun nanofibers are synthesized for flexible piezoelectric nanogenerators [19], the cytotoxicity of nickel ferrite nanocomposite [20], nickel ferrite nanospheres [21], the electromagnetic wave absorber nature of honeycomb-like $NiFe_2O_4$@Ni@C

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Structure, morphology, and ferroelectric behavior of $Ba_{1-y}Zn_yTiO_3$ (y = 0.2, 0.4, 0.6 & 0.8) nanoceramics

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The barium zinc titanate (BZT) nanoceramic samples were prepared via the hydrothermal technique. It was found from XRD patterns that the y = 0.2 to 0.8 compositions showed the cubic perovskite structure along with some secondary phases related to the zinc titanate (Zn_2TiO_4). The surface morphology indicated the formation of nanospheres like grains/particles for y = 0.2, and 0.3 compositions while the rest of the samples showed the rods like structures. Further the P-E loops of y = 0.2-0.8 samples showed the saturation of all samples.

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Keywords: Nanoceramics, Titanates, X-ray diffraction, Surface morphology; Ferroelectric

1. Introduction

It was a known fact that most of ceramic titanate materials belong to the perovskite family having a general chemical formula of ABO_3, wherein, A = divalent cation, and B = trivalent cation [1-5]. Barium titanate is a well-known dielectric, and ferroelectric material due to its predominant dielectric and saturation polarization value [6-12]. In addition, it revealed the significant properties like piezoelectric, pyroelectric, memory applications upon doping/substituting other cations like Zr, Pb etc., into its perovskite system [13, 14]. Thus, it received several applications in different fields of interest.

However, the research is going on still on doping/substituting different cations into either barium titanate or its based perovskite structure. This led to achieve more advanced properties of barium titanate-based ceramics in both bulk as well as nano. In this connection, we thought of doping zinc due to its wide energy gap behavior, and with the intention to check the diffraction pattern, topographical, and ferroelectric behavior. For the synthesis of barium zinc titanate nanoceramics, we opted a low temperature hydrothermal technique due to several advantages like low operating temperatures, pure crystallinity, homogeneity, easy preparation, and inexpensive [1-5]. Moreover, in the literature also many scientists [6-15] did research work barium titanate-based materials but very limited investigations were seen for the zinc doped barium titanate nanoceramics synthesized using hydrothermal method at small operating temperatures.

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Building blocks of Cwebs in multiparton scattering amplitudes

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Abstract: The correlators of Wilson-line operators in non-abelian gauge theories are known to exponentiate, and their logarithms can be organised in terms of the collections of Feynman diagrams called Cwebs. The colour factors that appear in the logarithm correspond to completely connected diagrams and are determined by the web mixing matrices. In this article we introduce several new concepts: (a) Normal ordering of the diagrams of a Cweb, (b) Fused-Webs (c) Basis and Family of Cwebs. We use these ideas together with a Uniqueness theorem that we prove to arrive at an understanding of the diagonal blocks, and several null matrices that appear in the mixing matrices. We demonstrate using our formalism that, once the basis Cwebs present upto order α_s^n are determined, the number of exponentiated colour factors for several classes of Cwebs starting at order α_s^{n+1} can be predicted. We further provide complete results for the mixing matrices, to all orders in perturbation theory, for two special classes of Cwebs using our framework.

Keywords: Higher-Order Perturbative Calculations, Resummation

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Eikonal Dressed Gluon Exponentiation to study power corrections to Thrust, C-parameter, and Angularity

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Abstract

Dressed Gluon Exponentiation is a well known method to study power corrections. We present here its eikonalized version – Eikonal Dressed Gluon Exponentiation (EDGE) [1] to determine the dominant power corrections to shape variables such as Thrust, C-parameter, and Angularity. Our method remarkably simplifies the calculations.

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1 Introduction

Event shape variables are classical tools for precise determination of the strong coupling constant [2–6] from collider data, and are useful while constructing the models for hadronization. Due to the infrared safety of the event shape variables, they can be calculated in the perturbation theory. The state of the art is NNLO calculations at fixed orders [7–11], while NLL [12–15], and NNLL resummation [16–27] frameworks have been developed over several years. If one denotes the event shape variable by e, then its corresponding distribution $d\sigma/de$ peaks in the two jet limit ($e \to 0$). In this particular limit the distributions are affected by the non-perturbative power corrections of order $(\Lambda/eQ)^n$ and $(\Lambda^2/eQ^2)^n$, arising from the soft gluon and the collinear gluon corrections respectively. Recently, linear power corrections for thrust, and C-parameter were presented in [28]. Here, we discuss the analytic non-perturbative corrections, which are suppressed by powers of (Λ/Q) as compared to the perturbative corrections.

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Preparation and Characterization of melt derived $CaO-Sb_2O_3-Li_2O$ containing borate glass for multiple application

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ABSTRACT

The antimicrobial efficiency, structural, optical, and electric transport properties of glasses of composition $xCaO.10Li_2O.20Sb_2O_3.(70-x)B_2O_3$ ($x = 0,2.5,5,7.5$ and 10 mol%) and the role of CaO have been studied in this work. The amorphous phase of the glasses was confirmed through an X-ray diffraction study. The optical bandgap energy (E_{opt}) was decreased with the addition of CaO, whereas, the refractive index values were increased. Urbach energy (ΔE) of the glasses varied from 0.32 to 0.48 eV. Density (ρ) of the studied glasses was found to increase from 3.38 g/cm^3 to 3.77 g/cm^3 with CaO content. Antibacterial efficiency of the glasses was examined through a well plate method against Escherichia Coli., Salmonella in terms of zone of inhibition and it is increasing with CaO content. Glass transition temperature (T_g) was decreased with increasing CaO content. NBOs play an significant role in achieving the higher order ionic conductivity. Due to the presence of Li_2O, Cole-Cole impedance plots exhibited semicircular behavior at high temperatures. FT-IR studies confirms the vibrations of B-O, B-O-B with B-O-Sb linkages in the glass.

Introduction

B_2O_3 (borate) based glasses have scientific interest owing to their thermal stability, low melting points, mechanical strength, good transparency, and ability to form glasses with various oxides [1,2]. Recently, borate-based glasses containing antibacterial elements like zinc and silver have been widely used in several bone settings, wound healing, and dental treatments [3,4]. The conversion of fundamental structural units $BO_3 \leftrightarrow BO_4$ depends on type and amount of the network modifier added to the B_2O_3 host glass network. The bridging (BOs) and non-bridging oxygens (NBOs) play an essential role in the suitability of the glass in various industrial applications. Due to the execution of short-range and intermediate-range order units, borate glasses are advantageous over the other oxide glasses[5].

Sb_2O_3 is a glass former with high refractive index, low phonon energy and high electronic polarizability. Due to high order optical susceptibility(χ^3) these glasses find extensive applications as broad range optical materials, amplifiers, ultrafast switches, in the field of radiation shielding [6, 7] and are used as anode electrodes for lithium/sodium ion rechargeable batteries. When it doped in borate glasses, the boroxol rings were reduced [8].The addition of Sb_2O_3 enhanced the stability and density and increased the third-order nonlinNLO coefficients and decreased the optical band gap energy due to the formation of NBOs in the glass system [9].

CaO acts as a glass network modifier and exhibits good antimicrobial activity [18]. Addition of CaO into a borate base glass network increases the number of non-bridging oxygen ions (NBOs) [10]. The glass exhibits antimicrobial activity due to the presence of Ca^{2+}cations, which passes through the bacterial membrane and kill the cells [11, 12]. Addition of Li_2O into calcium borate glasses leads to drastic changes in the ionic conductivity up to few orders. The activation energies (Ea) were found to be decreased [13]. The transition temperature T_g purely depends on

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ORIGINAL PAPER

Carcinogenic Chromium (VI) Sensing Using Transducing Characteristics of Fiber Bragg Grating and Physical Swelling of Hydrogel

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Abstract

A Chemo-mechanical-optical sensing approach for the detection of hexagonal chromium (Cr^{6+}) metal ion is demonstrated. A new sensor head is designed by epoxying fiber Bragg grating (FBG) on a thin silicon membrane beneath which a Chromium (VI) responsive hydrogel is embedded. When the gel is exposed to chromium spiked solutions, it suffers a volume change due to its stimulus responsive property and deforms a silicon membrane which in turn causes a wavelength peak shift of FBG. Hydrogel synthesized from the blends of (3-Acrylamidopropyl)—trimethylammonium chloride is used for the purpose. The relation between FBG peak shifts with change in volume of hydrogel due to it swelling is experimentally established. The FBG wavelength peak shift is directly correlated with the concentration of the Cr (VI) metal ion. The estimated sensitivity and resolution of the sensor are 0.1 nm/ppb with a limit of detection of the sensor is 0.75 ppb. The sensor has demonstrated good sensitivity, selectivity, and repeatability.

Keywords Fiber Bragg grating (FBG) · Cr (VI) sensor · Hydrogels · Stimulus response · Physical swelling

1 Introduction

Industrial revolution has resulted in elevated water contamination with heavy metal ions which is a major health threat both to humans and aquatic animals. Heavy metal ions are one of the major causes of water toxicity and carcinogenicity but their contribution towards toxicity is more [1]. Disorders of central nervous system, kidneys,

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Investigation of groundwater contamination from leachate migration: a case study of Bowen University dumpsite, Nigeria

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Abstract. A microstudy of soil physical properties in combination with geoelectric delineation were adopted for the evaluation of groundwater contamination prospect from leachate migration at Bowen University dumpsite location. Samples of soil were collected from five different locations, with five locations within the dumpsite and one control sample which is 200 m far away from the dumpsite locations. A core sampler which is attached to the soil auger is used to obtain each sample within 60 cm depth. Each sample is collected into a sample bag and properly labeled for laboratory analysis. Schlumberger electrode configuration was employed for the survey spread to delineate total of four (4) Vertical electrical sounding (VES) points with electrode spacing varying 60 to 100 m. This was done to obtain resistivity, thickness and depth within the dumpsite location. The results of the average value of the soil properties between the control and the dumpsite are compared such that the soil properties for control site reveal a bulk density (BD) of 1.45 g/cm^3, particle density (PD) of 2.63 g/cm^3 and porosity (PO) of 44.90%, respectively. Whereas, the mean soil properties of the dumpsite show that BD is 1.35 g/cm^3, PD is 2.93 g/cm^3, and PO is 54.07%, respectively. This signifies that the control location has high BD, low PD and low PO, while the dumpsite reveals an inverse of the control results. Also, the results from the interpreted VES data reveal the prospect of migration of contaminants from the topsoil to the alluvium, which could further percolate to the aquifer with time. It could be concluded that groundwater contamination is feasible within the study area, since an alluvium and porous soils could permit leachate migration to the aquifer.

Keywords: Groundwater contamination; Geoelectric sounding; Soil analysis; Leachate migration; Dumpsite; Vertical electrical resistivity sounding (VERS)

1. INTRODUCTION

The presence of contaminant in groundwater for industrial and domestic accomplishment can lead to a high severe risk on human health. The [42] has linked diseases which includes cholera, polio, diarrhea, typhoid, and dysentery, has some of the side effect of consuming water with contaminant and poor. The importance of groundwater to human cannot be over emphasized [38]. It is found useful both in households, farms, industries, and other essential places. The need to carry out investigation into groundwater exploitation especially areas with dumpsite facilities is crucial since the contaminant can migrate from topsoil to the aquifer. The contamination of groundwater in dumpsite facility has been

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Pt- and Pd- based intermetallic anode catalysts for direct ethanol fuel cell (DEFC): An overview

D. Saritha, N. Mahender Reddy, Gubbala V. Ramesh

https://doi.org/10.1016/j.matpr.2022.04.705

Abstract

Despite decades of research, the lack of highly active and durable catalysts for fuel cell operations continues to be a stumbling block in the development of advanced fuel cells. Direct ethanol fuel cells (DEFCs) attracted much tension due to simple design, high energy density and low toxicity of ethanol as compared to methanol. Ordered intermetallic compounds are an intriguing class of materials for electrocatalytic processes because of their unique chemical and physical features. Intermetallic nanoparticles (NPs) based on platinum (Pt) and palladium (Pd) for direct ethanol fuel cells have recently received a lot of interest. Pt- and Pd-based intermetallic NPs as electro catalysts have outstanding catalytic activity while also exhibiting exceptional stability under electrocatalytic conditions. The application of Pt- and Pd-based intermetallic electrocatalysts for DEFC is discussed in detail in this paper.

Keywords

Order intermetallic nanocrystals; Direct Ethanol Fuel Cell; Pd3Ti; Pt_3Nb; Pt_3Zr; Pt_3Ta

Materials Today: Proceedings

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Contemporary advancement on the alloy-based anodes for Sodium-ion batteries

N. Mahender Reddy, Gubbla V. Ramesh, D. Saritha

https://doi.org/10.1016/j.matpr.2022.04.531

Abstract

Energy storage has a budding worldwide alarm over the earlier era. As a consequence of improved energy calls associated with extreme rises in the fossil gasses cost and the ecological outcomes of their usage, they advanced the demand for globally accountable alternate bases for similar production of energy and storage. Batteries utilized in entirely transportable electronic devices are probable to these worldwide apprehensions. Li^+ has a small ionic radius, permits dispersion in solids, and is attached with its extended cycle lifespan and rate ability. Lightweight element, the low redox potential of Li allows cells with superior voltage and energy density. Furthermore, growing lithium employment in medium motorized batteries will eventually increase the value of lithium compounds, so assembling large-scale storage is excessively luxurious. Abundance, low price, and appropriate redox potential made the Na-ion batteries hopeful for energy storage applications Anode resources with superior capacity and extensive cycling steadiness are required to endorse the extra progress of Na-ion batteries. Current research advancement on alloy-based resources is summarized in this review.

Keywords

Na-ion batteries; Alloys; Anode; Review

Materials Today: Proceedings

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Effect of alternate fill pattern on mechanical properties of FDM printed PC-PBT alloy

Prachi Singhal [a], R. Sujithra [a] ✉, D. Saritha [b]

https://doi.org/10.1016/j.matpr.2022.04.470

Abstract

This study investigates the effect of alternate fill pattern, infill density, and annealing on tensile, flexural, short-beam strength, and fracture toughness of PC-PBT alloy printed by the FDM process. The alternate fill pattern is printed as similar to multilayer sandwich panels, linear fill pattern as skin and hexagonal (honeycomb) pattern as sandwich in between the linear pattern. Two sets of samples are printed, one with the alternate fill pattern of linear and hexagonal with 100% fill density and another with alternate fill density of 100% in linear and 70% in the hexagonal pattern are tested, without and with annealing. The tensile experimental result indicates that alternate fill pattern leads to brittle failure with the drastic reduction in the tensile strain at break compared with the standard value of PC-PBT. But the flexural modulus is significantly higher than the standard value. The flexural strength, short-beam strength, and plain-strain fracture toughness are high for alternate fill patterns with alternate infill densities of 100% and 70%. Annealing below glass transition temperature has a more significant effect on fracture toughness for the alternate fill pattern with alternate fill density (100% and 70%), and minor impact on tensile, flexural and short-beam strength. The printed alternate pattern has high fracture toughness as similar to composite.

Materials Today: Proceedings

Volume 62, Part 6, 2022, Pages 3973-3977

A concise review on the removal of heavy metals from wastewater using adsorbents

D. Saritha ✉

https://doi.org/10.1016/j.matpr.2022.04.579

Abstract

Water is the furthermost imperative natural resource in the ecosphere and vigorous for the existence of all living lives and human growth. Industrialization progress and household wastewater have increased contamination in water. Heavy metals contamination inside the water is a universal ecological problem. Several researchers extensively utilize the adsorption technique to eliminate heavy metals from polluted water. Adsorption remains a cost-effective technique and offers adaptable design and procedure. Scientists explored nanomaterials, including carbon-founded materials, metal oxides, polymer-founded materials as adsorbents to eliminate heavy metals from contaminated water.

Keywords

Heavy metals; Adsorption; Wastewater; Review

Materials Today: Proceedings

Volume 62, Part 6, 2022, Pages 3022-3026

Current advancement on anode materials for Na-ion batteries: Review

D. Saritha [a], C.H. Sandeep [b], R. Sujithra [c]

Show more

https://doi.org/10.1016/j.matpr.2022.03.068

Abstract

Na-ion batteries are owed as an ecological choice to Li-ion batteries essentially for intermediate and major system devices. They have been opted as gifted possible options to other batteries because of the prosperity and obtainable price of sodium assets and analogous electrochemical assets of sodium. Insertion sort and conversion kinds of anode materials are illustrated supported on their reaction procedures for Na-ion batteries. This review offers a comprehensive talk about the various vital factors such as reversibility; structural constancy, cycle life, and electronic conductivity of novel high-performance anodes. Viable strategies anticipated for designing superior performance anode materials are discussed.

Keywords

Anode; Insertion; Conversion; Na-ion batteries

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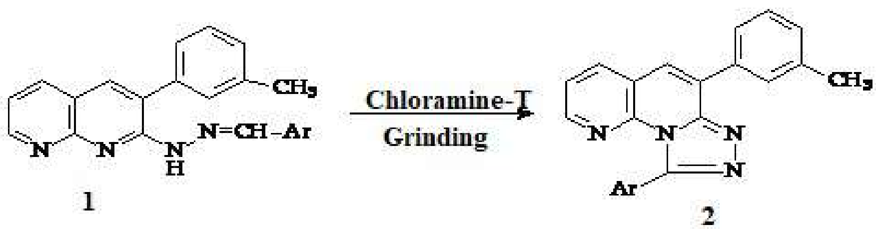

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b :	4-$CH_3C_6H_4$	g :	2-NO_2 C_6H_4
c :	4-$CH_3OC_6H_4$	h :	3-NO_2 C_6H_4
d :	2-Cl C_6H_4	i :	4-NO_2 C_6H_4
e :	4-Cl C_6H_4	j :	3,4-$(CH_3O)_2C_6H_3$

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Performance Parameters of Two Stroke and Four Stroke Copper Coated Spark Ignition Engines

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ABSTRACT

Alcohols are renewable in nature. They have comparable properties with gasoline. Blending of alcohol with petrol is common technique to improve the performance of the engine. Gasoline engines are suitable for individual transport and have many advantages over diesel engines in terms of lower vibrations, less weight and more efficient. Two stroke petrol engines have higher mechanical efficiency than four stroke petrol engines. In order to improve the performance, copper coating was applied for two stroke and four stroke petrol engines. Little reports were available on comparative studies on performance characteristics of two stroke and four stroke petrol engines with methanol blended gasoline. Investigations were carried out to evaluate the performance of two stroke and four stroke of single cylinder, spark ignition (SI)engine having copper coated engine [CCE, copper-(thickness, 300 μ) coated on piston crown, inner side of cylinder head and liner fuelled with methanol blended gasoline (80% gasoline and 20% methanol by volume) and compared with conventional engine (CE) with pure gasoline operation. Performance parameters of brake thermal efficiency, exhaust gas temperature and volumetric efficiency were determined at different values of brake mean effective pressure (BMEP). Brake thermal efficiency increased, exhaust gas temperature decreased and volumetric efficiency increased with methanol blended gasoline with both versions of the engine. CCE showed improvement in the performance when compared with conventional engine (CE) with both test fuels.

Keywords

SI engine, Methanol, CE, CCE, Fuel Performance, Exhaust emissions and Catalytic converter

1.INTRODUCTION

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CONTROL OF EXHAUST EMISSIONS OF TWO STROKE AND FOUR STROKE COPPER COATED SPARK IGNITION ENGINES

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*Corresponding Author

ABSTRACT

Alcohols are important substitutes for gasoline, as their properties are comparable to gasoline. They are renewable in nature. Investigations were carried out to determine exhaust emissions of two stroke and four stroke of single cylinder, spark ignition (SI)engine having copper coated engine [CCE, copper-(thickness, 300 μ) coated on piston crown and inner side of cylinder head] provided with catalytic converter with copper as catalyst with methanol blended gasoline (80% gasoline and 20% methanol by volume) and compared with conventional engine (CE) with neat gasoline operation. Carbon monoxide (CO) and un-burnt hydrocarbons (UBHC) are the exhaust emissions from SI engine. Breathing of these emissions causes human hazards and also they cause environmental disorders. Hence control of these emissions is an urgent task. Exhaust emissions were varied with different values of brake mean effective pressure (BMEP). The engine was provided with catalytic converter with copper as catalyst. There was provision for injection of air into the catalytic converter. CCE showed improvement in the pollutants when compared with CE with both test fuels. Four-Stroke engine decreased exhaust emissions effectively in comparison with two-stroke engine with both versions of the engine. Catalytic converter with air injection significantly reduced pollutants with different test fuels on both configurations of the engine.

Keywords: SI engine, Methanol, CE, CCE, Fuel Performance, Exhaust emissions and Catalytic converter

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1. INTRODUCTION

In the context of fast depletion of fossil fuels, the search for alternate fuels has become pertinent. Alcohols are probable candidates as alternate fuels for SI engines, as their properties are

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Characterization of Ligand N'-[(1E)-1-phenylethylidene]-1, 3-benzothiazole-2-carbohydrazide by using Marvin Sketch 20.8 Software

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ABSTRACT

Marvin Sketch is the fast and accurate software used for drawing of chemical compounds and reactions. This software also provide guidance and is integrated with calculators for obtaining the suitable results of properties. Marvin sketch 20.8 software is well equipped with advanced chemical viewer for studying the chemical structures both single and multiple 2D/3D, as well as chemical reactions and its related data. It can display all the details, like molecule name, generated IUPAC name and SMILES strings of molecules. With the help of Marvin Sketch 20.8 software the compound N'-[(1E)-1-phenylethylidene]-1,3-benzothiazole-2-carbohydrazide(PEBTH) is characterized and all its properties were determined.

Keywords: PEBTH, Mass spectrum, Structure display models, pKa, Isoelectric point, Log P, Charge, Polarisability, Orbital electronegativity, Geometrical Descriptors, Conformers, Topology analysis, Huckel analysis, Refractivity.

INTRODUCTION

N'-[(1E)-1-phenylethylidene]-1,3-benzothiazole-2-carbohydrazide(PEBTH)

Synthesis of N'-[(1E)-1-phenylethylidene]-1,3-benzothiazole-2-carbohydrazide(PEBTH) as given in Fig. 1 involves three steps(i) conversion of 2-aminothiophenol to benzothiazole-2-ethyl carboxylate by esterification(ii) conversion of ester to its hydrazide(iii) conversion of benzothiazole-2-carbohydrazide(BTCH)to N'-[(1E)-1-phenylethylidene]-1,3-benzothiazole-2-carbohydrazide(PEBTH) by reaction with acetophenone .

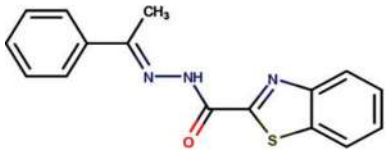

Fig. 1. Structure of PEBTH

RESULTS AND DISCUSSION

By using the Marvin Sketch 20.8 the structure of N'-[(1E)-1-phenylethylidene]-1,3-benzothiazole-2-carbohydrazide (PEBTH) was built and its name is determined as follows:

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Discontinuity, Nonlinearity, and Complexity 11(2) (2022) 363-372

Discontinuity, Nonlinearity, and Complexity

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Impact of Thermal Radiation on MHD Squeezing Flow of a Casson Fluid between Collateral Plates

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squeezing flow
thermal radiation
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Abstract

The present article mainly focuses on effect of thermal radiation on magneto hydrodynamic squeezing flow of Casson fluid between two equidistant plates. Non-linear partial differential equations of motion which are governing the flow are made non-dimensional by imposing similarity transformations. Runge-Kutta-Fehlberg scheme used here to solve these non-linear equations, by converting them into a set of initial value problem with single order. The velocity and temperature profile analysis has been carried out by taking into consideration of different parameters involved in it such as, squeeze number, magnetic number, Eckert number, radiation parameter, Prandtl number and Casson fluid parameter etc., and discussed them graphically in suitable manner such that interesting aspects of the solution can be adopted. And also, numerical results of nusselt number and skin friction co-efficient have been shown in this presentation. Velocity profile increases for increasing magnetic parameter near upper plate but it decreases near lower plate. Further same behavior observed for increasing squeeze number. Temperature profile increases with increasing magnetic parameter, radiation parameter and Casson fluid parameter but decreases with Eckert number.

1 Introduction

Squeezing flow between two equidistant plates has most significant role in various biological, bio-engineering and engineering industries, since it is useful in determination of the rheological properties of highly viscous fluids like molten polymers, ceramic pastes, hydro mechanical machinery and concrete. Some of the examples in biology for squeezing flow are synthetic transportation inside of living bodies, valves and diarthrodial joints etc. In starting days, several researchers have contributed their effort to interpret these types of squeezing flows. In this regard, Stefan [1] did the remarkable contribution to understand the heterogeneous flows, which helped for further research work on rheological properties of the fluid flows, by many of the researchers after him [2–8]. The two dimensional magneto hydro dynamic squeezed flow between parallel plates have been analyzed by

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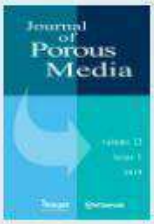

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ACTIVATION ENERGY PROCESS IN BIOCONVECTION NANOFLUID FLOW THROUGH POROUS CAVITY

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ABSTRACT

This article reports the activation energy process in thermo-bioconvection flow via porous media within the four-sided cavity filled with gyrotactic microorganisms and nanofluid. The Darcy model with Boussinesq approximation is utilized for the momentum equation in porous medium. The Pedley and Kessler model is utilized for the concentration equations of gyrotactic microorganisms. The finite-difference approach is employed to solve the converted equations. The influence of significant quantities such as activation energy (E), temperature difference (δ), chemical reaction (ω), Peclet number (Pe), Brownian motion (Nb), and buoyancy ratio (Nr) is discussed. Further, the mean quantities of Nusselt number, average Sherwood numbers of microorganisms, and nanoparticles are interpreted at the hot wall. It is determined that the Peclet number and activation energy show a destabilizing effect on the isoconcentrations of nanoparticle volume fraction and microorganisms. A significant effect on the bioconvection and heat transfer is noticed against the activation energy, temperature difference, and chemical reaction parameters.

KEY WORDS: activation energy, gyrotactic microorganisms, nanofluid, Peclet number, porous square cavity

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Nanofluid Bioconvection in Porous Enclosure with Viscous Dissipation

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In this paper, the bioconvective nanofluid flow in porous square enclosure containing oxytactic microorganism associated with viscous dissipation, is discussed. The bioconvection flow in porous medium is framed by Darcy-Boussinesq approximation. Galerkin finite elements method is employed to solve the governed equations. The computational numerical results are exhibited by the surface plots of stream function, temperature, concentration of oxygen and microorganisms, average Nusselt number, average Sherwood numbers of oxygen and microorganism concentrations. The effects of key parameters such as Peclet number (Pe), Rayleigh number of bioconvection (Rb), viscous dissipation (Ec), thermophoretic parameter (Nt), parameter of Brownian movement (Nb), Lewis number (Le) and Rayleigh number (Ra) are presented and analyzed.

Keywords: Thermo-bioconvection; Oxytactic microorganisms; Thermophoetic force; Square enclosure in porous medium; Viscous dissipation; Peclet number; Brownian motion

1 Introduction

Abundant investigations on convection and heat transfer through porous media are ascribed to the enormous of applications, such as utilization and storage of thermal/geothermal energy, reservoirs of petroleum, devices of catalytic convertors, dispersion of underground pollutants, underground feeder cables, technology of porous ceramic burners, food industry, tertiary recovery, chemical reactors, chemical separations, moisture migration in stored grain, thermal cooling of electronic equipment, heating of rooms, combustion. The basic nature and increased volume of research in concerned discipline are adequately archived by Nield and Bejan[1], Vafai[2], Pop and Ingham[3]. Natural convection in cavities of various geometries discovers a salient feature for the analysis of engineering. It has huge applications in solar energy, cooling system for buildings, electronics industry, etc. Many authors have examined the natural convection phenomenon in a porous square cavity [4–8].

A latest development for microfluidic devices is bioconvective heat transfer in porous media. It refers to a macroscopic convective movement of fluid induced by swimming of motile microorganisms. Different types of microorganisms showing various swimming behaviors, can be found. Microorganisms of negative geotaxis swim opposite to gravity[9]. The swimming trend of gyrotactic microorganisms depend on the balance of gravitational and viscous forces[10,11]. Generally, oxytactic microorganisms swim towards the upper surface since the upper surface of any layer is opened to the atmosphere wherever the oxygen density is abundant. Growth of microorganisms at the upper surface generates the inverting instability, which leads to the formation of bioconvection. Hillesdon *et al.*[12] and Hillesdon and Pedley[13] developed the theoretical model of bioconvection due to oxytactic micro-organisms. Many authors studied the onset thermobioconvection containing oxytactic microorganisms[14–17]. Kuznetsov[18] presented a continuum model for thermobioconvection of oxytactic micro-organisms in porous media and examined the mixed consequences of up swimming of bacteria and heat transfer below horizontal porous layer. Ahmed *et al.*[19] investigated thermo-bioconvection in a homogeneous and isotropic porous medium saturated square enclosure containing oxytactic microorganisms.

The emerging area of nanofluids has gained substantial attention by research community owing to its outstanding attribute of enhancing the thermal conductivity comparative to base fluids. This concept

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A STUDY ON DEMOGRAPHICAL BUYER BEHAVIOUR IN PURCHASE OF SUVs

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ABSTRACT

Today Four-Wheeler has become a necessity and forms a part of life. Due to emergence of globalization and liberalization, there is a stiff competition among the variety of car manufacturing units which are focusing attention in capturing the Indian market. Cars though considered as a luxury once, now occupies a part of day-to-day life and have become necessity. Consumer needs can be fulfilled based on their requirements and interest. In the present scenario, a consumer gives more importance to easy, convenient, stylish and more comfortable vehicles rather than highly sophisticated vehicles. So SUV's are dominating the four wheeler market in India as the preference of the customers are changing .Consumer behaviour is a complex one. It differs from person to person as well as product to product. This study aims at identifying the demographic factors influencing the purchase of four wheeler, analyse the purchase behaviour of consumers and examine the level of satisfaction and factors influencing the level of satisfaction. So this study is responsible for successful survival of manufacturers for easy marketing of their four wheelers in existing market or in a global market. It also helps the consumers for the important areas of satisfaction about their products. Consumer behaviour refers to the actions and decision processes of people who purchase goods and services for personal consumption. Consumer behaviour refers to "the mental and emotional processes and the observable behaviour of consumers during searching for, purchasing and post consumption of a product or service. The purpose of the paper is to study the consumer buying behaviour towards SUV's. Samples were taken from Hyderabad and Secunderabad. Both Primary and secondary data were used in research. One sample frequency and Chi-square analysis was used as data analysis statistical tools.

KEY WORDS: Globalization, Liberalisation, Necessity, Emotional processes

1. INTRODUCTION

The Automobile Industry is one of the fastest growing sectors in India. The increase in the demand for cars, and other vehicles, powered by the increase in the income is the primary growth driver of the automobile industry in India. The introduction of tailor made finance schemes, easy repayment schemes has also helped the growth of the automobile sector.

The automotive Industry directly and indirectly employs 13 million individuals in India. The industry is valued at about US$ 35 billion contributing about 3.1 percent of India's GDP (nominal). India's cost-competitive auto components industry is the 2nd largest in the world. In addition, India's motorcycle market is also the 2nd largest in the world with annual sales of around five million units. India has become one of the international players in the automobile market.

A STUDY ON CONSUMER BUYING BEHAVIOR REGARDING FEATURES OF SUV'S CAR

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ABSTRACT

In Present Marketing Scenario, the Study of Consumer Behaviour has become essential. Without consumers no business organization can run. All the activities of the business concerns end with consumers and consumer satisfaction. Customer behaviour study is based on consumer buying behaviour, with the customer playing the three distinct roles of user, payer and buyer. Consumer buying behaviour has become an integral part of strategic market planning. In order to develop a framework for the study consumer behaviour it is helpful to begin by considering the evolution of the field of consumer research and the different paradigms of thought that have influenced the discipline. Consumer behaviour involves the psychological processes that consumers go through in recognizing needs, finding ways to solve these needs, making purchase decisions, interpret information, make plans, and implement these plans. Consumers often buy products not because of their attributes per se but rather because of the ultimate benefits that these attributes provide, in turn leading to the satisfaction of ultimate values. A market comes into existence because it fulfils the needs of the consumer. Consumer behaviour is a complex, dynamic, multidimensional process, and all marketing decisions are based on assumptions about consumer behaviour. Models of consumer behaviour play a key role in modern empirical Industrial Organization. The present study is concentrating on the important of features which will motivate the customers to buy the car. In the present scenario SUV car are dominating in the market. Customers are intended to go for the big car and their expectation or features motivating them. The study is conducted for selected brands in the selected customers.

Key words: consumer satisfaction, strategic market, Scenario, Attributes, multidimensional, empirical.

1. INTRODUCTION

It is a globally accepted fact that in recent times, marketers have become dynamic and the consumer has control over the strategic decisions made by the insurance companies. Companies are put to challenge to understand the pulses of new age policyholders and their buying pattern. India, in this scenario is no exception. It is being a nation of diverse cultures and traditions, understanding the consumers‟ buying pattern become a hard task. With the advent of globalization and the sequel changes in the country, many Multinational Insurance Corporations have started making a foray into Indian market due to its sky-scraping potential. Business environment today is turbulent as never before and the service industry as promising as never before. In this era of intense competition where customer is the king, success depends a lot on the efficiency of the managers in delivering what they have promised and the responsibility lies on the organizations to develop such a culture where business ethics are followed, value for the services is provided and quality services are offered to achieve higher level of customer satisfaction. For achieving customer satisfaction understanding dynamic consumer behaviour is essential. As true believers in the marketing concept marketer should try their best to meet needs of consumers. Service firms should follow a proactive approach i.e. begin the service and satisfaction management process before

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A Study on Employee Satisfaction towards Hr Practices in Care Hospital in Twin Cities of Hyderabad & Secunderabad

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ABSTRACT

The employee Job satisfaction represents one of the most complex areas facing today's managers when it comes to managing their Employees. It is the most important area which must be given maximum concentration by the organization. Unless and until each and every organization spares no effort to find out the particular problems which affect not only their satisfaction but the entire performance, it will make the oodles of disturbance. Employee satisfaction plays a vital role in the organizations performance. Employee satisfaction will result in improving organization productivity. In this study hr polices of care hospital is evaluated and related to employee satisfaction. This study was done in care hospital Nampally branch, Hyderabad. To conduct this research we collected the information from 138 employees in care hospital. We collected the primary data through 5 pointlikert scale and secondary data through sources like websites, books etc. we collected the data through convenience sampling. The data of 138 employees was collected through questionnaire and analyzed using percentage analysis, two tailed z test at 5% level of significance where the critical value is 1.96. We found that the employee's satisfaction is related with the hr policies in the care hospital. In that study we found that the employees are satisfied with individual characteristics, organization design, work culture, and not satisfied with compensation, work environment, interpersonal relationships .This study proved that employee satisfaction and hr practices are related to each other. The HR policies should be examined from time to time to meet the employee's job satisfaction in organization and it helps to improve employee's performance. By implementing new hr policies we can retain employees in the organization. The managers should concentrate in analyzing the employees performance and hr practices in the organization and revive the hr polices in the organization in regular intervals.

KEY WORDS :Employee Satisfaction, HR Practices, Organisational Performance

INTRODUCTION

Research refers to the search for the knowledge. One can also define research as a scientific, systematic search for the actual information on a specific topic. In fact research is anartofscientificinvestigation."A careful investigation or enquiry especially through search for new fact in any branch ofknowledge."This study is designed to perform a Descriptive analysis of employee perception inCARE HOSPITALS (P) LTD.

EMPLOYEE SATISFACTION:

Employees are the real capital of every industry; they are the ones that make a difference between successful strategy implementation and mediocre one. Employee satisfaction is a requirement for good employee performance as well as employee retention. Retaining and finding the best staff is becoming harder and harder. Positively influencing staff is one way to develop an environment and culture where people want to do their best and want to stay. Employee satisfaction may be defined as, "the terminology used to describe whether employees are happy and contented and fulfilling their desires and needs at work. Many measures purport that employee satisfaction is a factor in employee motivation, employee goal achievement, and positive employee moralein the workplace." Employee dissatisfaction can be a catalyst for major issues within an organization — especially within a customer driven field likehealthcare. Happy employees equal happy patients.

A major cause of employee dissatisfaction is the lack of clarity about what is expected of them. "In almost every survey of

A Study on The Relationship between Training and Development Activities and Employee Performance

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Abstract: The present study tries to examine the relationship between training and development activities and employee performance. The study also tries to establish a relationship between the performance of an employee and the factors associated with employee performance. For the purpose of the study, data has been collected through a structured questionnaire from 150 respondents of five select IT Companies from Cyberabad, choosing 30 employees from each Company using a two-step sampling approach, stratified and convenience sampling techniques. The data were analysed using SPSS software and the tools used to analyze the data were Cronbach Alpha, Kruskal Wallis Test and Ordinal regression. The analysis has concluded that employee performance has a strong relationship with the factors associated with employee performance.

Key Words: Employee Awareness, Employee Performance, Employee Satisfaction, Training and Development, Employee Morale, Employee Motivation.

I. INTRODUCTION

Training and development have become invincible practices that every organization cannot deny. Earlier, there was an emphasis on motivating the individuals by rewarding them for performing better. Monetary and non-monetary benefits like ESOPs, profit sharing, team incentives, retention bonuses etc were provided to the employees if they performed better. It was discovered over a period of time that implementing training and development activities at the workplace keeps motivating employees. There is enough evidence available in literature and research that the training activities positively impact employee performance, which is crucial for the cause of any organization. Organizations, today are either recruiting skilled individuals or training their hired employees to perform better which stresses the significance of training at all levels.

II. REVIEW OF LITERATURE

A study was conducted to understand the impact of training on employee performance. The level of employees selected for the study were operational level employees of a selected apparel organization in Srilanka. An analysis was done based on the responses given by the sample of machine operators. The analysis revealed that a strong, positive and significant relationship was established between training and development practices and employee performance. A correlation value of 0.817 indicated a positive relationship between the variables. It is very important for the management of an organization to discuss with their employees and identify their training needs and then plan their training programmes accordingly. The line managers have to understand the importance of training and plan training activities accordingly to their subordinates. On a quarterly basis at least, the management should check and update the skill inventory of its employees. To enable the employees to be competent in their field, training should be a regular practice. The management should assume investment in training as an investment for the future and be optimistic towards training programmes. (Kuruppu et al., 2021)

A study was conducted on a population of doctors, nurses, clinical officers and other subordinate staff working at the government hospitals of Siaya country. Respondents were chosen based on stratified random sampling. It was discovered that there was a positive correlation between training and development procedures and employee performance among Siaya's health staff. Employees favour monetary and non-monetary incentives in equal measure. Non-monetary incentives, on the other hand, are favoured over monetary rewards. This doesn't indicate that non-monetary incentives like training etc are not required to motivate the employees. The research has revealed that the non-monetary incentives like providing training and others were highly motivating and preferred by the health sector employees, although there were fewer monetary benefits given. Thus, non-monetary benefits serve a dual purpose. Firstly, they help in overcoming the absence of adequate monetary benefits. Secondly, they are able to fulfil other needs of the employees like autonomy, respect, belongingness etc.(Onyango & Wanyoike, 2014)

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A Study on The Analysis of Employee Awareness of Training and Development Policies and Their Relationship with Employee Performance

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Abstract: The present study tries to examine the awareness of employees of select IT companies towards the company training policy. The study also tries to understand the relationship between employee performance and their awareness of company training and development policy. For the purpose of the study, data has been collected through a structured questionnaire from 150 respondents of five select IT Companies from Cyberabad, choosing 30 employees from each Company using a two-step sampling approach, stratified and convenience sampling techniques. The data were analysed using SPSS software and the tools used to analyze the data were Cronbach Alpha, Kendall's W Test and Ordinal regression. The analysis has concluded that employee performance has a strong relation with company training policy

Key Words: Employee Awareness, Employee Performance, Employee Satisfaction, Training and Development, Training needs, Training and Development Policies.

I. INTRODUCTION

Training is the technique for assisting a person with captivating his proficiency and viability in the working environment by improving furthermore, refreshing their expert information by making capacities pertinent to their work and developing reasonable conduct and demeanour towards work and people. Training is explicitly formal in particular ways. While education is essentially stressed with information improvement, training is essentially expected to increment understanding, animate disposition, and bestow capacities connected to a specific work. It's a deep-rooted and continuous technique.

Training is a movement program that is time-bound. Along these lines, there is a redone particular discipline of coaches blending in the field of human movement. We are living in such a phase where the world resembles a small town. The distance between various countries around the world seems to be decreasing and the business of Organizations seems to be expanding as a result of Globalization. In such a situation, every organization should be aware of the dynamics of Global Change, and they should deal with utmost attention when dealing with the consequences of Globalization. The concept of Training has been explained in a variety of ways by different experts in the field of Training and development. A few of the definitions are given as follows.

"Training is the process of teaching new employees the basic skills they need to execute their jobs," says Garry Dessler.

"Training is the process of giving and receiving information relevant to problem-solving," says Jack Halloran.

Flippo, Edwin B. "Training is the act of enhancing an employee's knowledge and skills for completing a specific job," he explained.

"Training is the planned technique through which people learn knowledge and increase skill for a particular purpose," says Dale S. Beach.

II. REVIEW OF LITERATURE

The following steps can be followed while implementing Training Programmes in an Organization which will be satisfactory for both employees and the Organization (Salah, 2016):

- Identification of training needs
- Analysing organizations training needs
- Formulate training objectives
- Review existing training methods
- apply existing methods or design new ones
- implement the training programme developed
- evaluate training and development methods
- measure the achieved results against standards
- provide effective feedback to participants.

The role of Training and Development was examined and it was found to be a prominent determinant for improving employee productivity and performance at work (Singh, n.d.). The implementation of training and development programmes at workplace has a positive result on the

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The Role of an On-Page Optimization for an Effective Digital Marketing

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ABSTRACT

Search Engine Optimization (SEO) is the method of influencing the popularity of a website or web page in the unpaid results sometimes referred often referred to as "natural", "organic", or "earned" resultsof a web search engine. SEO explores the way search engines operate, where people search for and the search phrases or keywords are entered into search engines, as a web marketing technique.The primary search results for all major search engines such as google, bing, and yahoo are shown on web pages and on any other material including videos or local listings, depending on what is deemed most important to users by the search engine. To customize a website, the contents of the site, HyperText Markup Language (HTML), and associated code should be changed, both for increasing its relevance to common keywords and removing obstacles to search engine indexing. Promoting a site to increase the number of backlinks, or inbound links, is another SEO tactic. Search Engine Marketing (SEM) is a type of internet marketing that involves promoting websites by increasing their exposure on search engine results pages (SERPs), mainly through paid ads.While off-page search engine optimization is important. On-page optimization includes all of the actions we take within web pages to help web site rank better. When it comes to on-page optimization, there are eight key targets are playing key roles. The eight targets are Keyword Optimization, Site Structure, Internal Linking, Usability, Mobile Version of the Website, Customer Reviews, Rich Snippets and Social Media Integration. In this paper, we would like to review these eight key factors and review a one case using the website structure as a part of on-page optimization techniques for effective digital marketing.

Keywords: On-page Optimization; Digital Marketing, Internet Marketing, Search Engine Optimzation

1. INTRODUCTION

Search Engine Optimization is the process of streamlining the structure and content of a website to make it position well in search engine results. Originally search engines were quite basic and we could do well for search phrases based just on the keywords that were onwebsite, nowadays with Google dominating, the ranking methodologies are far more complex and Google state there are about 200 factors that are considered by their search engine before given a placing in the results.

Some of these factors have more weight than others. Adjusting the website to take into consideration just one of these can create a positive outcome for the website in search placing. Combining all of them could mean that website could jump from 60th place to 4th place or even 1st. It does all depend though oncompetition and what they're doing to make sure they do well in Google too. As SEO becomes more popular, ranking sites do too but clever planning from the start will result in good placing.On-page SEO simply means optimizing the web page content to improve search engine rankings and attract organic traffic. In addition to content, on-page SEO techniques include optimizing the headlines, HTML tags, URLs, images, internal links, etc. It includes ensuring trustworthiness and authoritativeness to improve website credibility for better search engine ranking [9].

2.OBJECTIVES

To overview the role of on-page optimization in digital marketing.

3. LITERATURE REVIEW

The better the website structure, the betterchance of a higher ranking in the search engines. Every website has some “structure.” It might be a rigorous and streamlined structure, or it may be a disorganized jumble of pages. The website isintentional and careful withsite structure, it creates a site that achieves search excellence.

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Article

Impact of Non-Performing Assets on the Profitability of Select Public Sector and Private Sector Banks

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ABSTRACT

Nationalized (government-owned) banks, commercial banks, and specialized banking institutions are the three basic categories of Indian banking. Banking industry plays a vital role for the development of the economy of any country Non-performing assets are a challenge that all banks are confronting today, whether they are public or private sector banks. Non-performing assets have been the single biggest source of annoyance for India's banking sector. The lender will lose money if the borrowers stop paying interest or principal on their loans. Such a loan is known as non-performing assets (NPA).Non-performing assets have a major impact on the Indian banking industry. The aim of the present research is to study the impact of Nonperforming Assets on Profitability of public sector banks and private sector banks for the ten years 2011 to 2020. On the basis of secondary data, the research paper seeks to assess various non-performing asset ratios.This research examines the significance of non-performing assets and its impact on Profitability using Regression. The finding reveals that there is no significant impact of Nonperforming Assets on profitability of select private sector banks during the period. The banking sector should focus on effective management of nonperforming assets (NPAs) in order to increase their profitability and so supply as much funding to the industry as possible.

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INFLUENCE OF SOCIAL MEDIA MARKETING ON ONLINE SHOPPING

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ABSTRACT:
"Influence of Social Media Marketing on Online Shopping" is related to study of how social media marketing is affecting the final consumers who mostly use social media websites. Social Media Marketing is very important and it is among the most successful tool and technique in the field of every type of advertising. It is already known that how various marketing tools and techniques can be increased number of selling articles is the main aim of every businessman. Data is collected from conducting an online survey and Secondary data is collected from websites, articles and Journals. Tools for analysis used are Percentage Analysis, Cross Tabulation, Chi Square Test, Likert's scale and Mean Score were used to analyze the collected data. Data collected from online survey is analyzed and discussed. In Chapter 6 Findings and Conclusions, At the end of this study concluded by saying that Mid age people were greatly influenced by social media marketing. Especially, in pandemic usage of online sites has increased rapidly.
Key words: Social media marketing, online shopping, e-commerce, marketing Communication, traditional marketing.

INTRODUCTION

The field of marketing communications is rapidly changing. Brand managers continually attempt to gain advantage over competitors and endeavour to achieve larger market shares and profits for the brands they manage. Marketing communications, ormarcom for short, is just one element of the marketing mix, but advertising, sales promotions, public relations, direct marketing, personal selling, and social media/ online marketing tools are performing increasingly important roles in firms' attempts to achieve financial and non financial goals.

Social Media Marketing

Social media marketing represents forms of electronic communication through which user-generated content (information, ideas, and videos) can be shared within the user's social network. It is the process that allows individuals to promote their websites, products, or services through online social channels that may not have been available via traditional channels. It is the process where organizations use social media websites to build rush on their company official websites. Organizations also inform the potential customers of happenings in the organization, launch of the new model or product and latest news about the organization through social media applications.

Social media needs to be a part of a company's marketing budget because it gives a powerful way to create a connection with the targeted audience. From Instagram to LinkedIn, there are virtually limitless ways to interact and share information as well as market the products. Social networks enable to connect with new customers and stay in touch with the existence customers. Social media enhances customer service by creating accessibility to customers who have a tendency to seek immediate feedback. It responds in a timely manner to their concerns and inquiries. Consumers rely on social sites to find out about products and services. Optimized profiles and useful information will create a positive first impression for online business.

REVIEW OF LITERATURE

Sreekanth, K., Shakeel, S., Nedumaran, D.G. and Manida, M.,2020 in their study aimed to identify and explore nearly all frequently purchasing products online also influencing factors on the online buying behaviour of the school students. Objectives include: To study the benefits and challenges of online shopping. To list out the Best Online Shopping Sites in India, Datawas collected through structured questionnaire circulated from 200 respondents. Statistical tools like percentages,

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A Road to Become Successful in The Fashion Industry of China: A Case Study of Zara

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Abstract

+ Article information

Abstract

In this research, it was found that Zara is facing issues while maintain its profitability and also while maintaining its large stores. Existing information collected from websites and articles show that Zara provides inferior quality products, does not have factory in China, focuses less on e-commerce activities, and contributes directly to environment pollution through waste generation in China. These are reasons that the organization is losing its brand image in China. To improve its current condition, it is recommended that Zara should improve its products, focus more on marketing, develop factories in China and reduce environment pollution.

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Capturing GreenTech-related Commercial Activities of Listed Companies

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Digital Disruptions -A Paradigm Shift in Management

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ABSTRACT

Accelerated global market shifts and digital economy have become a reality. Digital economy is growing and evolving fast. Digital technologies have made much easier accessto global capital, talent and other resources. Emerging markets companies have become global competitors for established firmsfrom developed countries. The article presents the results of the research of digital disruptors and their impact on different business spheres. For the purpose of the current article digital transformation is understood as a multilevel technology-based change in the firms that includes both the exploitation of digital technologies to improve existing processes and their efficiency, and the exploration of digital innovation, which can potentially transform the business model. Digital technologies have changed both central targets of any company: customers and the markets. It was concluded that in order to succeed in digital transformation firms' organizational structures should be reorganized from hierarchical decision-making and toward a network team based flexible agile structure.

Keywords: Digitalization, digital transformation, digital disruption, multinational companies, management challenges

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Ownership pattern and firm performance: corporate governance in Indian firms

Daman Jeet

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Abstract

Firms are defined by a set-up of associations that represent contractual provisions for financing, capital structure, managerial ownership and recompense. It has been observed from business history that these relationships have disagreements but virtually every party has alleged to the overall objective of good performance of the business. Previous studies have investigated the relationship among various parties within a firm and the impact on performance through agency theory as this theory leads to separation of ownership and control. But the results of previous studies are rather mixed due to disparity in measures of ownership and performance. This study looks for examining performance under different and detailed list of

Keywords

corporate governance | ROA | ROE | Tobin's Q | BSE

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Strategies for employee retention

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***Abstract*---**Work places are second to home, where every employee wants to build strong relation and depend on each other. Organizations should ensure that employees are delighted to work with and should build a long career with the organization so that mutual growth can be ensured. This is only possible when employees in the organizations are retained for long durations. Attrition is much these days because of many reasons. To curtail attrition organizations are striving a lot to design the relevant strategies. This paper highlights what attrition is and its causes, importance of retention, and the strategies to be adopted by the organizations to improve retention of employees in the organization.

***Keywords*---**employee retention strategies, employee retention, attrition, curtailing attrition, improving retention.

Introduction

Hiring is a difficult process: an HR professional selects a few candidates from a huge pool of applicants, performs preliminary interviews, and then refers the candidates to their respective line managers, who question them further to see whether they are a good match for the company. The process of finding the ideal applicant takes time. A company spends time and money preparing an employee so that he is ready to work and comprehend the corporate culture: A new joiner is inexperienced, and management must work diligently to train him for his overall growth. When someone quits a company unexpectedly, it is a tremendous waste of time and money. HR must begin the hiring process. It's a waste of time to go through the process again for the same job. Finding the appropriate person for a company is a time-consuming process, and all of your efforts are wasted when the employee goes.

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A STUDY ON ROLE OF AVAILABILITY OF RESOURCES IN THE EFFECTIVE MANAGEMENT OF POWER LOOM INDUSTRY

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ABSTRACT
Resource Management which is a facet of project management that envelops the human, financial, distribution and demands of project resources. It is crucial for any kind of organization, as it ensures efficient utilization planning; it furnishes an overview of everyone and everything and even makes planning and management transparent. The present study is concerned with the availability of resources in the power loom industry and also to examine the factors affecting productivity, problems faced by the workers and the initiatives taken by the units so as to develop the power loom industry in the Rajanna Siricilla district of Telangana State. The data collected from a convenient sample size of 127 respondents working in the power loom industry is analyzed using percentage analysis, descriptive statistics, correlation and factor analysis. This study made an attempt to see the association between availability of resources and organizational effectiveness using correlation. The study reveals that the major factors affecting the productivity of the power loom industry are lack of experience & skill of the workers and poor condition of machines/equipment. Efforts are put in by the units to see that available People's talents are recognized, developed and correctly utilized by the power loom industry. Workers are satisfied with the kind of supervision by the firms in development of the power loom industry. Niche product development, providing training for skill up gradation are the initiatives taken in the units in order so as to develop the power loom industry
KEYWORDS: Resources Management, Productivity, Power loom industry

1. Introduction

The Indian textile industry has a lucrative existence in the Indian economy as is considered as one among the largest industry in the world. Every Organization irrespective of its nature and size, believes that the ultimate credo of resource management is maximizing efficiency. To ensure such efficiency, understanding the availability and utilization of such resources and problems relating to such resources is often needed. Nikhat Sultana (2017) in her study stated that in Telangana state, Rajanna Siricilla District stands testimony of the resources crisis. She concluded that the vulnerabilities of crisis were due to weak inappropriate policies and lack of resources. So the present study is conducted to know the availability of resources to the power loom weavers and to know how well they are utilizing the resources and focuses to find out the problems faced by the power loom weavers at present.

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A Study on the application of Capital Asset Pricing Model on selected NIFTY 50 Stocks

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Abstract: **The Capital Asset Pricing Model (CAPM) is a general equilibrium market model evolved to analyze the relationship between risk and required rates of return on assets when they are held in well-diversified portfolios. As a result, a security's only impact on market risk is through its systemic risk; however, measuring systematic risk does not reveal whether or not stocks are accurately priced. Risk and return are related. The higher the risk the higher the returns and a person is willing to accept risk, the better the returns he/she is able to achieve. CAPM assists in identifying under-priced or overpriced qualitative properties. As a result, picking the right stock to get the desired return has become a problem for investors. With regard to NSE NIFTY stocks, this study is conducted with the aid of CAPM to assist investors in the discovery of right-priced stocks. measure the return on stocks selected Asian paints, PowerGrid, Nestle, Britannia and Hindustan Unilever and to measure the risk of selected securities.**

Key terms: NSE NIFTY, CAPM, Beta, Risk, and Return

I. INTRODUCTION

The risk or variation in the return on a security is caused by two types of factors: The first type of factor affects the performance of almost all securities in the market; Examples of such sources of risk are interest rate changes and market inflation. Economy, movement of the stock index and movement of the exchange rate. The risk caused by such factors is called systematic risk. In addition to the systematic risk, the variation in the performance of a security is also caused by a number of other factors specific to a security, e.g. B. a strike against a company or the caliber of management of a company. The risk caused by such factors is called unsystematic or specific risk. The unsystematic risk of a security can be diversified by combining different securities in a portfolio. Diversification through portfolio construction so that the real risk of a security is a systematic risk, as investors can diversify unsystematic risks through portfolio construction. A security's tic risk is measured using a statistic called beta. The beta of a security measures the sensitivity of a security's return to changes in the performance of the market portfolio or the stock index.

Capital Asset Pricing Model (CAPM):

The Capital Asset Pricing Model (CAPM) is a general equilibrium market model designed to analyze the relationship between risk and required returns on assets in well-diversified portfolios. between the required return (Ri) of a security and its systematic or non-diversifiable risk, measured by the beta of the security. The systematic risk of a security, as measured by the security's beta coefficient, is market risk, which cannot be.

The CAPM requires a number of broad assumptions:

- All investors will have an expected benefit from maximizers of terminal wealth in a single time period.
- Choose between alternative portfolios based on the expected return and the standard deviation of each portfolio.
- Unlimited Amount at a Specific Risk-Free Rate Investors have homogeneous expectations (that is, investors have identical estimates of expected values, changes, and covariances in return for all assets).
- All assets are perfectly divisible at the current price and there are no transaction costs that are perfectly negotiable. There are no taxes.
- All investors are price takers (that is, all investors assume that their own buying and selling activities will not affect share prices). The amounts of all assets are indicated and determined.

According to Capital Asset Pricing Model approach, the required return on a security is given by the equation:

$R_i = R_f + \beta(R_m — R_f)$

Where,

Ri = Required rate of return on security i or cost of equity.

R_f = Risk-free rate of return. β = Beta of security i.

R_m = Rate of return on market portfolio

II. METHODOLOGY

Research problem:

Investors always try to maximize the expected returns with respect to their analysis and risk bearing capacity. The peril associated with the holdings is that the return the study of

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An Examination of Most Influencing factors that triggered online shopping trend in Pharmaceutical Sector

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Abstract

The e-commerce market in Indian pharmaceutical services is rising tremendously and helps to expand both the accessibility of customers online and offline for purchasing medicines. This move ultimately allows the Indian pharmaceutical industry to meet customers' needs more quickly. The e-medicine convenience enables patients to drift into the online purchasing mode, especially after the enhancement in worldwide web users.Thus, the present study is focused to identify the factors that has triggered the business of E-Pharmacy. Finding of study suggests that 55% of the respondent prefer offline pharmacy whereas 39% respondent prefer to purchase the medicines from online pharmacy. It has been observed that still there is lack of awareness about E-Pharmacy among Indian that is the reason of untapped E-Pharmacy market.

Keywords:*e-pharmacy, offline pharmacy, shopping trends, pharmaceutical sectors*

Introduction

India is one of the world's biggest distributors of generic drugs. The Indian pharmaceutical industry is meeting the requirements of 40% of different vaccines worldwide. Furthermore, the Indian pharmaceutical industry caters for 40% of US and 25% of UK generic medicines demand (ibef, 2019). India is recognized as the largest exporter of pharmaceutical drugs across the globe.[1]

Pharmaceutical industries are facing tough competition regarding the selling process of drug to the consumer in India. Drug selling process takes place through two different modes that are offline and online. Drug can be sold offline mode through the brick-and-mortar store such as pharmacy store, retail store, Hospitals and malls but on the other hand, online store, which is also known as E-phamacy. E-pharmacy is based on the principle of mobile application, where you

[1]https://www.gbreports.com/article/the-worlds-pharmacy-indias-generic-drug-industry

AN EMPERICAL STUDY ON GROWTH OF STARTUP TRENDS AND ECOSYSTEM IN INDIA

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Abstract
Two years ago, the central government launched the 'Start-up India' initiative to nurture innovation and entrepreneurship in the country, capturing the entrepreneurial spirit of the youth. The initiative promised to build an ecosystem conducive to scaling up start-up companies. The Start-up India action plan of the government is a very important step in strengthening the entrepreneurial ecosystem in the country. This article is an endeavour to portray the start-up ecosystem in India, which has also focused on the global best practices. The ecosystem for successful start-ups typically starts with proper mentorship with a mix of technological and directorial support. India has made a strong name for itself in the global start-up community and ranks among the top five countries in the world in terms of number of start-ups founded. It is estimated that the job creation from these entrepreneurs is likely to reach 250,000– 300,000 by 2020. The Indian food start-ups are now playing a pivotal role in accomplishing transformation, and trying and testing innovative technologies and business models. The innovations in this segment have been the result of improving technology in three segments: ordering food, food preparation and finally delivery. To seize the opportunity for the food industry, it is important to understand the dynamics around the start-up ecosystem. The challenges in the space are many, but it is heartening to see the passion and ability of the young start-ups who are working towards accomplishing their goals. The consolidation is the new mantra for food delivery companies, while quality will be the decisive factor, playing a catalytic role in the near future for health-conscious consumers.

Keywords: Starts-ups, entrepreneurship, eco-system, GOI, food segmentation and safety and operations

Introduction

Indian government is serious in promoting entrepreneurship at the start-up level and has taken a number of initiatives. In this aspect it is relevant to mention 'Make in India' campaign introduced in September'14 to attract foreign investments and encourage domestic companies to participate in the manufacturing sector. In order to make the country as number one destination for start-ups, Government of India (GOI) has introduced a new campaign called 'Stand-up India' in 2015 Sector wise, the distribution of Indian businesses. Start-up Ecosystem facilitated through various government departments & programs 4000 Start-ups have benefitted in the last year through various programs of the Central Govt. 960 crore of funding has been enabled to Star-tups through various scheme.

Recently government of India has launched "Start-up India" initiative to foster/support and encourage start up efforts in India. The results are very satisfactory with initiative being accepted with open arms in country, various state governments have also started the similar efforts. India stands at a very important cross road, India stood at number three in overall technology driven stat ups in the world (Top two positions are held by USA and UK respectively). The very nature of start- ups in India is technology based which is fuelled by young IIT's graduates as the patterns of start- ups in India further suggests, they are undertaken in very unconventional terrain like medical etc. Indian government is constantly trying to create an environment which is both conducive and optimum for stat ups. The reason is very simple, start- ups are necessary for the entrepreneurial and innovative growth of any nation. There are nations which are smaller than ours and less naturally equipped than ours, but made tremendous growth and advancements in the field of economy and overall development. The secret of their success is nothing but an appetite for innovation. If India wants to be in the front lines with developed nations in the

THE ROLE OF HUMAN RESOURCE MANAGEMENT DEPARTMENT IN EMPLOYEE RETENTION

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