Chaitanya Bharathi Institute of Technology

An Autonomous Institute Affiliated to Osmania University, Hyderabad

भारतीय प्रौद्योगिकी संस्थान तिरुपति
TIRUPATI

Departments of Artificial Intelligence and Data Science & Electronics and Communication Engg.

Inauguration of

POSITIONING, NAVIGATION AND TIMING (PNT) LABORATORY

(20th September 2025)

By

Dr.Y.V.N.Krishan Murthy
Sr.Professor and Registrar, IIST
Chief Guest of Inaguration

Dr. Roshan K.Srivastav
Project Director, IITTNIF
Guest of Honor of Inauguration

Chief Patron
Sri.N.Subash, President

Patrons
Prof.C.V.Narasimhulu
Principal

Advisor
Prof.A.D.Sarma
Advisor, R&D

Coordinating Heads
Prof.K.Radhika
HoD, AI&DS

Dr.K.Vasanth
Assoc.Prof & HoD, ECE

PNT Lab Investigators

Dr.D.L.S.Reddy
Assoc. Professor, AIDS
Principal Investigator

Dr. T.Sridher
Assist Professor, ECE
Co- Principal Investigator

Mentors:

DR N V Koteswara Rao
Professor, ECE

Dr D Krishna Reddy
Professor, ECE

Dr. A Supraja Reddy
Assoc.Prof, ECE

Dr. M.Vinodh Kumar
Assoc.Prof, ECE

Dr K S R S Jyothsna
Asst. Professor, ECE

Dr N Dhanalaxmi
Asst. Professor, ECE

Dr. D Sony
Asst.Prof, ECE

Sri.K.Lakshmanna
SRA, R&E HuB

Indian Institute of Technology Tirupathi (IITT) Navavishkar I-Hub Foundation (NIF) selected CBIT for setting up Position, Navigation and Timing (PNT) Lab under IITT NIF initiative with Dr. D.L. Srinivasa Reddy as Principal Investigator and Dr.T.Sridher as Co-Principal investigator. Funding for procuring the equipment related to PNT projects and twenty internships with stipend for doing projects in PNT areas is provided under this project. The PNT lab will primarily function to support UG and PG students in undertaking their course projects under the guidance of PNT-experienced faculty at institute and IITTNIF experts. The CBIT is also selected as a Nodal Institute for the PNT Lab to contribute meaningfully to the advancement of PNT technologies.

Scope :

The PNT Lab at NCRC, CBIT is primarily focuses on advancing prototype/product development, innovation, and applications in the PNT sector. The key technologies covered under this lab include:

- **Global Navigation Satellite System (GNSS)/IRNSS** – Technology, and product development of applications using GPS, NavIC (IRNSS), Galileo, and other satellite-based navigation systems for precise positioning and tracking.
- **Indoor Navigation** – Development of sensor-based and vision-based navigation systems for positioning in indoor environments where GNSS signals are weak or unavailable.
- **Computer Vision** – Utilization of image processing, object detection, and deep learning for applications such as autonomous navigation, terrain mapping, and real-time localization, implementing camera-based tracking, motion capture, and real-time localization for various applications.
- **Marine Navigation** – Evaluating both navigation and communication performance is crucial in marine environments. Field experiments can be conducted using marine data

Expected Outcomes :

The PNT Lab is expected to deliver significant benefits in Technology development, skill enhancement, industry collaboration, and start-up incubation. The key outcomes include:

- Development of base models for PNT Technologies & Products
- Support for UG and PG Students in PNT Projects
- Industry-Oriented Training for Final-Year Students
- Enhanced Placement Opportunities in the PNT Sector
- Providing Skilled Manpower for industries & Startups

All are invited

Schedule:

09:30 – 10:45AM	Inaguration of the function
11:00 – 11: 45 AM	Key Note Address by Dr.Y.V.N.Krishan Murthy
11:45 – 12:30 AM	Key Note Address by Dr. Roshan K.Srivastav
12:45 – 01:10 PM	Inaguration of PNT Lab
01:00 – 02:00 PM	Lunch
02:00 – 03:30 PM	Interaction with Interns and Review of the progress of projects
03:30PM	High Tea
04:00 PM	Conclusions

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)
Kokapet(Village), Gandipet, Hyderabad, Telangana-500075. www.cbit.ac.in

REPORT ON THE INAUGURATION OF THE POSITIONING, NAVIGATION, AND TIMING (PNT) LABORATORY

Organized by:

Departments of **Artificial Intelligence and Data Science (AI&DS)** and **Electronics and Communication Engineering (ECE)**
Chaitanya Bharathi Institute of Technology (CBIT), Hyderabad
Date: 20th September 2025

1. Introduction

The inauguration of the **Positioning, Navigation and Timing (PNT) Laboratory** at CBIT marks a significant milestone in the institute's commitment to advancing research and innovation in the fields of navigation, satellite systems, and real-time positioning technologies.

This laboratory has been established with the support of the **Indian Institute of Technology Tirupati (IITT), Navavishkar I-Hub Foundation (NIF)** under its national initiative to promote the development of indigenous PNT technologies.

2. Chief Guests and Patrons

- **Chief Guest:** Dr. Y.V.N. Krishan Murthy, Sr. Professor and Registrar, IIST
- **Guest of Honor:** Dr. Roshan K. Srivastav, Project Director, IITTNIF
- **Chief Patron:** Sri N. Subash, President
- **Patrons:** Prof. C.V. Narasimhulu, Principal
- **Advisor:** Prof. A.D. Sarma, Advisor R&D

Coordinating Heads:

- Prof. K. Radhika, HoD, AI&DS
- Dr. K. Vasanth, Assoc. Prof. & HoD, ECE

3. PNT Lab Investigators and Mentors

- **Principal Investigator:** Dr. D. L. Srinivasa Reddy, Assoc. Professor, AI&DS
- **Co-Principal Investigator:** Dr. T. Sridher, Assistant Professor, ECE

Mentors:
Dr. N.V. Koteswara Rao, Dr. D. Krishna Reddy, Dr. A. Supraja Reddy,
Dr. M. Vinodh Kumar, Dr. K.S.R.S. Jyothsna, Dr. N. Dhanalaxmi,
Dr. D. Sony, and Sri K. Lakshmanna (SRA, R&E Hub).

4. Scope of the PNT Laboratory

The PNT Lab at CBIT focuses on **research, prototype development, innovation, and application of PNT technologies**. Key technological areas include:

- **Global Navigation Satellite Systems (GNSS)/IRNSS:**
  Development of GPS, NavIC, Galileo-based applications for precise positioning and tracking.
- **Indoor Navigation:**
  Sensor and vision-based systems for indoor environments lacking GNSS signals.
- **Computer Vision:**
  Use of image processing and deep learning for autonomous navigation, terrain mapping, and real-time localization.
- **Marine Navigation:**
  Evaluation of navigation and communication performance in marine environments through field experiments.

- 5. **Guided Research:**
  Faculty mentors from CBIT and IIT Tirupati guide students in developing innovative models and prototypes in navigation and timing technologies.
- Under the guidance of mentors, students explore and develop projects across a variety of **interdisciplinary PNT domains**, including:

- **Satellite-Based Navigation:** Development of algorithms for accurate positioning using GPS, NavIC, and Galileo signals.
- **Indoor and Hybrid Navigation Systems:** Sensor fusion techniques combining Wi-Fi, Bluetooth, and camera data for indoor tracking.
- **Timing Synchronization and Signal Processing:** Design of models for time accuracy in communication and IoT systems.
- **Computer Vision Applications:** Using AI and deep learning to process visual data for object tracking, terrain recognition, and autonomous movement.
- **Marine and Vehicular Navigation:** Experiments on improving navigation accuracy in dynamic environments

6. **Cross-disciplinary Learning:**
Students from AI&DS and ECE departments collaborate, combining **AI, data processing, and communication systems** for integrated PNT solutions.

Students from both disciplines bring **complementary expertise** that enhances the quality and depth of research and project development:

- **AI&DS Students contribute:**
  - Skills in machine learning, deep learning, and data analytics.
  - Knowledge of signal classification, predictive modeling, and pattern recognition.
  - Proficiency in programming (Python, R, MATLAB) and handling large datasets.
- **ECE Students contribute:**
  - Strong understanding of communication systems, signal processing, and embedded hardware.
  - Expertise in antenna systems, microcontrollers, sensors, and wireless communication protocols.
  - Ability to design and implement circuits and real-time signal acquisition systems

7. Funding and Collaboration

The initiative is **funded by IITT NIF**, which provides resources for laboratory setup, the procurement of PNT-related equipment, and **20 student internships** with stipends. The collaboration aims to strengthen CBIT's capacity as a **Nodal Institute** in PNT technology research and development.

8. Objectives and Outcomes

The PNT Lab aims to:

- Develop **base models** for PNT technologies and products.
- Support **UG and PG students** in research and project work.
- Provide **industry-oriented training** to enhance employability.
- Foster **collaborations with industry and startups.**
- Create **skilled manpower** in the navigation and timing domain.

Expected Outcomes:

- Prototype and product innovation in PNT technologies.
- Strengthened academic-industry collaborations.
- Enhanced placement opportunities in the PNT sector.
- Development of India's indigenous expertise in navigation systems.

9.Key Learning Domains for Students

Area	Student Learning Scope
Global Navigation Satellite Systems (GNSS)/IRNSS	Learn how GPS, NavIC, and Galileo systems work; develop tracking and navigation applications.
Indoor Navigation Systems	Build sensor-based and computer vision-based indoor positioning systems.
Computer Vision & Deep Learning	Apply image processing and AI for autonomous navigation and object detection.
Marine Navigation	Understand navigation and communication challenges in marine environments through data-driven experiments.
Timing and Synchronization	Study how timing signals are used for synchronization in communication and IoT systems.

10.Student Outcomes and Impact

The expected outcomes for students from PNT Lab involvement include:

- Development of prototype models and working projects based on real-world navigation challenges.
- Enhanced employability and placement opportunities in the PNT and tech sectors.
- Building a strong foundation for higher studies and research in advanced navigation systems.
- Contribution to India's self-reliance in indigenous navigation technologies.

Conclusion

The **PNT Laboratory** at CBIT represents a significant step forward in enhancing the institution's research and innovation ecosystem. The collaboration with **IIT Tirupati NIF** empowers faculty and students to work on advanced navigation and timing systems, contributing to India's self-reliance in strategic and industrial applications of PNT technology.

GALLLERY

CBIT Marks Decade of NCRC and Launches PNT Laboratory

DECCAN NEWS SERVICE
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The Chaitanya Bharathi Institute of Technology (CBIT) celebrated a landmark Decennial Anniversary of the Navigation and Communication Research Centre (NCRC) under the Department of Electronics and Communication Engineering (ECE). The occasion also saw the inauguration of the state-of-the-art Positioning, Navigation, and Timing (PNT) Laboratory, established with support from IIT Tirupati's Navavishkar i-Hub Foundation, jointly by the Departments of ECE and Artificial Intelligence & Data Science (AI&DS).

The event was graced by Dr. Y.V.N. Krishna Murthy, Adjunct Professor at IIT Tirupati & Former Registrar of IIST Trivandrum, as Chief Guest, and Dr. Roshan K. Srivastav, Project Director, Technology Innovation Hub, IIT Tirupati, as Guest of Honour.

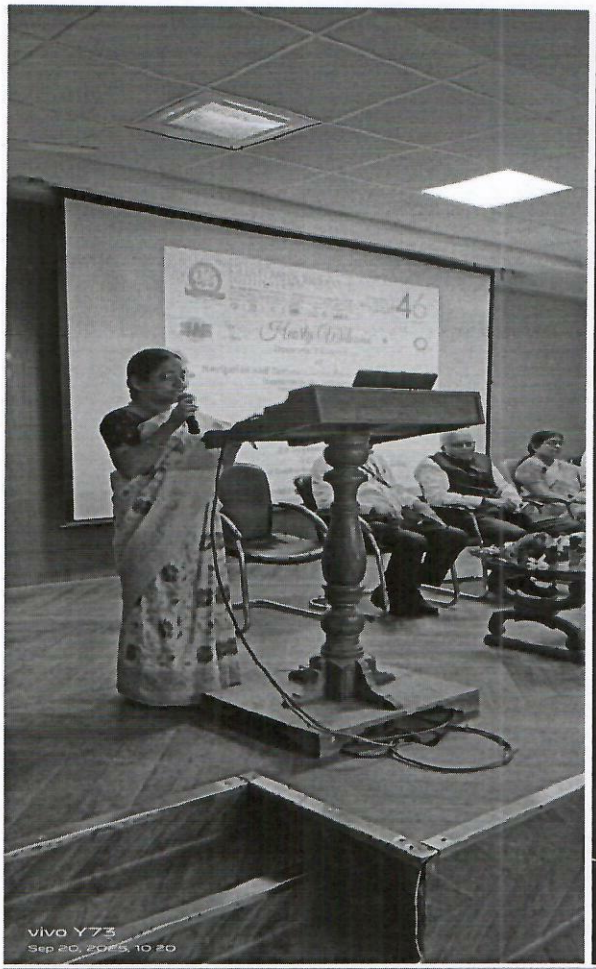
Dr. D. Krishna Reddy, Director R&D at CBIT, highlighted NCRC's achievements since 2014, noting the successful execution of 11 sponsored research projects, submission of technical reports to government agencies, and 34 doctoral degrees awarded in areas including wave propagation, navigation, communication, signal processing, and RF/microwave engineering. NCRC has also collaborated with SAC Ahmedabad, JNTU Kakinada, defence laboratories, and other academic institutes.

In his keynote, Dr. Y.V.N. Krishna Murthy lauded CBIT's research foundation, emphasizing India's strategic assets NavIC and GAGAN, and described indigenous portable atomic clocks as "game changers" for sectors like banking, power, and disaster management. He urged students to approach research as a social responsibility and highlighted low-cost mobile innovations like geotagged apps and 3D mapping as practical alternatives for governance and disaster response.

Dr. Roshan K. Srivastav appreciated CBIT's laboratories for providing students with hands-on exposure to real-world challenges in navigation, communication, and AI technologies. He encouraged collaboration through IIT Tirupati's Navavishkar i-Hub Foundation to develop solutions of national and global relevance.

Dr. D L. S. Reddy, Principal Investigator of the PNT Project, detailed the laboratory's vision to enable impactful research and training in navigation, positioning, and timing, fostering indigenous technologies for India's self-reliance.

The event also featured the release of the 3rd volume of the NCRC brochure and felicitations for distinguished guests. CBIT leadership, faculty, and student interns attended, celebrating a decade of research, innovation, and academic excellence at NCRC.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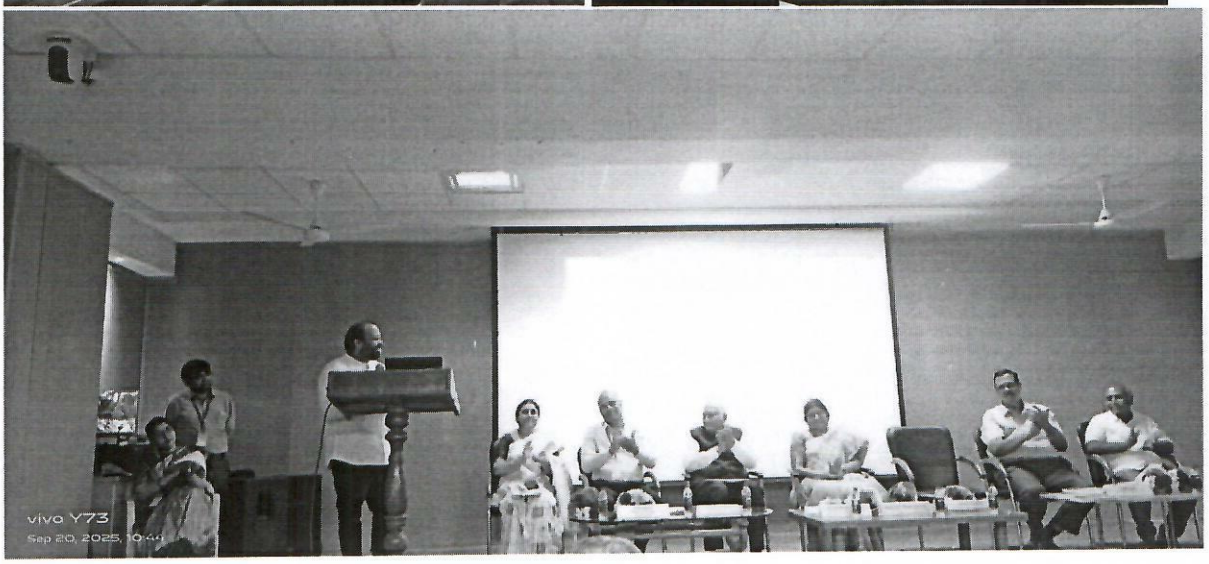
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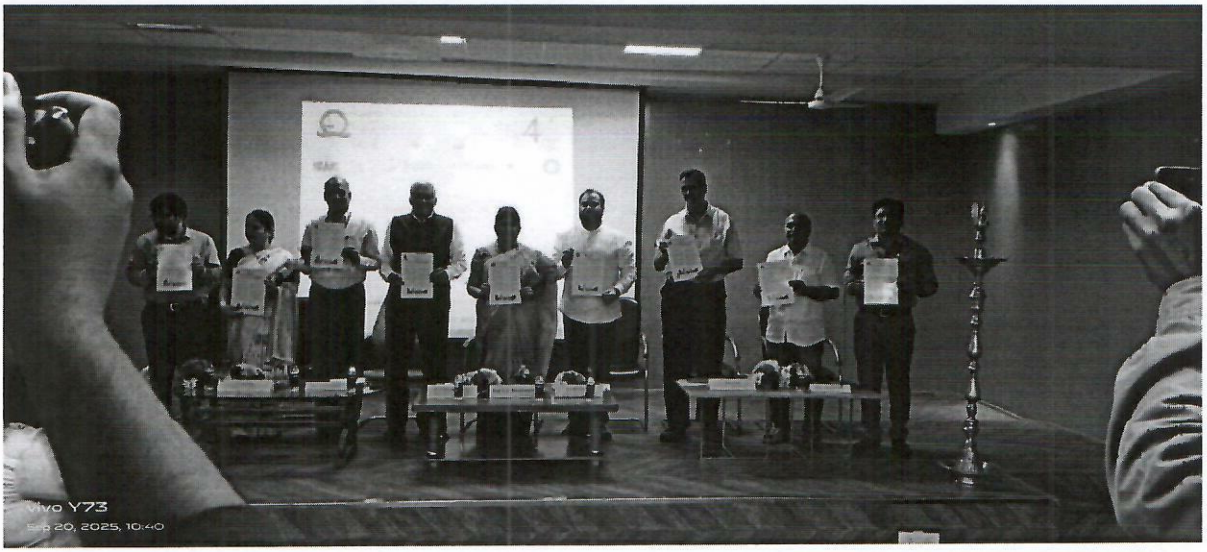

Event coordinator

HoD, AI&DS.