Autonomous Navigation Systems

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In news

Recently, IIT Hyderabad has set up ‘TiHAN-IIT’ testbed for autonomous navigation systems

About autonomous navigation systems

- An autonomous navigation system can safely navigate unmanned vessels in real-time and in a real-life environment without human intervention.
- Recently UK-based tpgroup ’s patent pending autonomous navigation system, Northstar, has completed its sea trials programme, demonstrating that it can safely navigate unmanned vessels in real-time and in a real-life environment – without human intervention.
- Northstar delivers real-time optimum route management and collision avoidance for unmanned platforms, in any environment (including GPS-denied), without human control.
- It achieves this through fusing real-time and reference data to create a layered 3D synthetic environment, and optimising paths within this digital environment – along with considering platform dynamics against user-defined measures of performance, time, cost and risk

About ‘TiHAN-IIT’

- Technology Innovation Hub on Autonomous Navigation and Data Acquisition Systems was set up with the financial assistance Rs. 135 crore of the Department of Science and Technology to IIT Hyderabad under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)
- The Technology Innovation Hub on Autonomous Navigation Systems for Unmanned Aerial Vehicles and Remotely

Operated Vehicles at IIT Hyderabad, known as 'TiHAN Foundation' has been incorporated as a Section-8 company by the institute in June 2020.

- TiHAN is a multi departmental initiative, including researchers from electrical, computer science, mechanical and aerospace, civil, mathematics and Design with collaboration and support from reputed institutions and industry
- This hub focuses on addressing various challenges hindering the real-time adoption of unmanned autonomous vehicles for both terrestrial and aerial applications
- The hub's focus sectors include Intelligent, Autonomous Transportation and Systems, Agriculture, Surveillance, and Environmental & Infrastructure Monitoring.
- The developed testbed in TiHAN will be available for use by industries, R&D labs, academia conducting research and development in the broad areas of autonomous navigation

About the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)

In order to harness the potential of this new wave of technology and make India a leading player in CPS, the Union Cabinet approved the launch of National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) to be implemented by the Department of Science & Technology (DST) with a total outlay of Rs. 3660 Crore for a period of five years

Aim of the mission

The Mission aims to create a strong foundation and a seamless ecosystem for CPS technologies by coordinating and integrating nationwide efforts encompassing knowledge generation, human resource development, research, technology and product development, innovation and commercialization.

Implementation of the mission

- The mission will be implemented through a network of 15 Technology Innovation Hubs (TIHs), 6 Sectoral Application Hubs (SAHs) and 4 Technology Translation Research Parks (TTRPs).
- Each hub and technology park will follow a technology life cycle approach, addressing all stages viz. Knowledge-Development-Translation-Commercialization
- The first Phase of NM-ICPS will focus on establishing six Technology Innovation Hubs (TIHs) in the following domain areas:

    1. Artificial Intelligence and Machine Learning
    2. Technologies for Internet of Things and Everything (IOT & IOE), Sensors, Activators and Control
    3. Databanks & Data Services, Data Analytics
    4. Advanced Communication Systems
    5. Robotics & Autonomous Systems
    6. Cyber Security and Cyber Security for Physical Infrastructure

- The first phase of NM-ICPS will be implemented by the Science and Engineering Research Board (SERB).