Report on Technical Talk

Name of the Event: "Connected Vehicles: Applications, Advances and Security"

Date & Time: 03.03.2025 & 2:30 PM (IST)

Venue: Committee Room, Department of Electronics Engineering, IIT(BHU), Varanasi

Organized by: IEEE MTT-S Student Branch Chapters, and Department of Electronics Engineering IIT(BHU), Varanasi

No. of Participants: 11 Students + Staff

About the Event

A technical talk on "Connected Vehicles: Applications, Advances and Security" was organised by the Electronics Department in the Committee Room, on Monday, 03.03.2025, at the Indian Institute of Technology (BHU), Varanasi. The event commenced with opening remarks by Dr. Om Jee Pandey, Assistant Professor of the Department of Electronics Engineering by introducing the speaker to the audience and expressing gratitude to the speaker, Dr. Moumita Patra, Associate Professor, IIT Guwahati. Dr. Patra shared an insightful presentation that delves into focussing on how this connectivity enhances road safety, optimizes traffic flow, and improves the overall driving experience.

Key Highlights of the Talk:

- **Vehicle-to-Everything (V2X) Communication:**

1. Encompasses **Vehicle-to-Vehicle (V2V)**, **Vehicle-to-Infrastructure (V2I)**, **Vehicle-to-Pedestrian (V2P)**, and **Vehicle-to-Network (V2N)** interactions.
2. Enhances road safety, traffic efficiency, and situational awareness.

- **Advanced Safety Features:**

1. Collision avoidance systems, lane departure warnings, and emergency braking.
2. Real-time hazard detection and alerts to prevent accidents.

- **5G and IoT Integration:**

1. High-speed, **low-latency communication** for seamless data exchange.
2. Enables **over-the-air (OTA)** software updates and remote diagnostics.

- **Autonomous and Assisted Driving:**

1. Supports self-driving capabilities with **AI-driven decision-making**.
2. **Adaptive cruise control** and automated parking for enhanced convenience

Environmental Benefits and Telematics:

1. Optimized fuel efficiency and reduced emissions through intelligent driving.
2. Integration with electric vehicles (EVs) for smart energy management.
3. Remote monitoring of vehicle health, fuel usage, and driver behaviour.
4. **V2C (Vehicle-to-Cloud):** Allows data exchange with cloud-based services for real-time navigation, weather updates, and entertainment.

Future Perspectives:

The future of connected vehicle technology is set to revolutionize transportation, integrating cutting-edge advancements in communication, artificial intelligence (AI), and automation. In a fitting conclusion, Dr. Om Jee Pandey and Dr. Somak Bhattacharyya, Associate Professor, Department of Electronics Engineering, IIT (BHU), Varanasi and Faculty Advisor, IEEE MTT-S SBC IIT BHU presented a memento of appreciation to the speaker.


Connected Vehicles: Applications, Advances, and Security
Mournita Patra