IEEE SMC Distinguished Lecture Report

1. Title and Header Information:

- **Event Title:** IEEE SMC Distinguished Lecture on *Human-Centric Robotics and Machine Intelligence for Transportation*

- **Date:** June 28th

- **Time:** 10:00 AM - 11:00 AM (UK time)

- **Venue:** 0.28 Portland Building and Zoom

- **Speaker:** Prof. Junmin Wang, University of Texas at Austin

- **Organizer:** IEEE SMC Portsmouth Chapter (Chair: Dr Dongxu Gao: dongxu.gao@port.ac.uk)

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2. Introduction:

On June 28th, 2024, the IEEE Systems, Man, and Cybernetics (SMC) Society hosted a distinguished lecture featuring **Prof. Junmin Wang** from the University of Texas at Austin. Prof. Wang, an expert in robotics and machine intelligence, delivered a lecture titled *"Human-Centric Robotics and Machine Intelligence for Transportation"*. Approximately **90 participants** attended the session, both in person and virtually, including professionals, researchers, and students from fields related to robotics and transportation systems. The presentation centred on the transformative role of machine intelligence and human-centric robotics in revolutionizing ground mobility.

3. Summary of Lecture Content:

Prof. Wang's lecture explored the convergence of advanced robotics, machine intelligence, and ground transportation, emphasizing how vehicle connectivity and automation are shaping the future of mobility. Key points from the presentation include:

- **Human-Centric Robotics and Machine Intelligence:** Prof. Wang focused on the integration of robotics and machine intelligence to address long-standing challenges in ground transportation. The emphasis on human-centric design aims to ensure that the technologies are not only efficient but also trusted by users.

- **Vehicle-to-Everything (V2X) Communication:** The advent of V2X communications was highlighted as a major breakthrough, unlocking unprecedented access to real-time information that can improve energy efficiency, roadway safety, and human acceptance.

- **Interdisciplinary Integration:** Prof. Wang discussed the interplay between physical vehicle characteristics, computational and communication capabilities, and human behaviour modelling. These elements, combined with control theory, estimation, and optimization, pave the way for safer, more reliable transportation systems.

- **Research on Intelligent Vehicles:** The presentation also showcased ongoing research projects involving intelligent vehicles as a form of ubiquitous robotic systems, all working towards the goal of creating efficient, safe, and human-trusted mobility solutions.

The presentation underscored the importance of seamless integration between technology and human factors to achieve a balance between operational efficiency, safety, and user trust in future mobility systems.

4. Lecturer's Presentation Style and Delivery:

Prof. Wang delivered the lecture with clarity and enthusiasm, seamlessly guiding the audience through complex technological concepts. His use of multimedia tools, such as visual diagrams and case studies, helped to elucidate the more intricate aspects of vehicle-to-everything communication and machine learning in transportation. The presentation was engaging, and Prof. Wang's passion for the subject was evident throughout. The Q&A session was particularly interactive, with Prof. Wang addressing a variety of questions from the audience, ranging from the technical challenges of integrating robotics with human behaviour models to practical applications in real-world transportation systems.

5. Audience Reception and Participation:

The lecture attracted a total of 90 attendees, both in person and online, from diverse fields such as robotics, machine learning, and transportation engineering. The audience was actively engaged throughout the session, asking insightful questions about autonomous vehicles, the ethical implications of AI in transportation, and the future of smart mobility. The lively Q&A session demonstrated the audience's interest in the potential societal impact of Prof. Wang's research, and many attendees expressed interest in further exploring collaborative opportunities.

6. Impact and Contribution to the SMC Community:

Prof. Wang's lecture made a significant contribution to the ongoing discourse within the IEEE SMC community. His exploration of human-centric robotics and machine intelligence provided new insights into how transportation systems can become more efficient, safer, and more trusted by users. The research presented offers a comprehensive vision for future mobility systems, where technology, human behaviour, and ethical considerations are seamlessly integrated. The lecture inspired further discussion on the importance of user trust in autonomous systems and opened up new possibilities for research and collaboration within the SMC community.

7. Concluding Remarks:

Prof. Junmin Wang's distinguished lecture was an insightful and thought-provoking session that left a lasting impact on the attendees. His innovative approach to combining robotics, machine intelligence, and human behaviour modelling in transportation systems highlighted the critical need for interdisciplinary research in this area. The lecture successfully fostered a deeper understanding of the future challenges and opportunities in ground transportation, positioning the IEEE SMC Society at the forefront of these discussions.