

Human-Centric Robotics and Machine Intelligence for Transportation

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Abstract: The relentless progress in computing and communication technologies has inaugurated a transformative era in ground mobility, presenting unprecedented opportunities to address enduring challenges in ground transportation. This talk explores some recent breakthroughs in the realm of human-centric robotics and machine intelligence, focusing on their pivotal role in revolutionizing ground transportation. The fusion of vehicle connectivity and automation emerges as a cornerstone, holding the potential to reshape the transportation paradigm. The advent of smart mobility technologies, particularly vehicle-to-everything communications, has unlocked an unparalleled wealth of information. This information, when harnessed strategically, can usher in substantial enhancements in vehicle operational energy efficiency, roadway safety, and human acceptance. The talk delves into the intricate interplay of diverse elements, including physical insights into vehicle system characteristics, computational prowess, communication capabilities, and the nuanced modeling and prediction of human behavior. By seamlessly integrating these facets with theories of control, estimation, and optimization, a promising avenue opens for crafting future mobility systems that are not only more efficient and safer but also engender trust among users. The presentation sheds light on ongoing research endeavors centered on various intelligent vehicles as a ubiquitous robotic system. These research activities collectively strive towards the overarching goal of cultivating efficient, safe, and trustworthy human-centric ground transportation.