Mechatronics in Cyber-Humans-Vehicles Systems

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Abstract: The recent advances on computational and communication technologies have led the ground mobility into a new era where mechatronics plays an essential role. In particular, the smart mobility technologies such as vehicle-to-vehicle, vehicle-to-infrastructure, and vehicle-to-human communications have offered an unprecedented information richness and availability, which if utilized intelligently may enable substantial improvements on vehicle roadway safety and operational energy efficiency that are of societal importance. Synergistic combinations of physical insights into vehicle system characteristics, computational and communication capabilities, human user modeling and prediction, as well as theories of control, estimation and optimization may offer effective means for tackling the grand roadway safety and energy consumption challenges. This talk introduces a variety of smart vehicle systems multidisciplinary research activities aiming to safe and efficient ground transportation by collaboration and synergy among cyber systems, humans, and vehicles, a growing mechatronic field.

Bio: Prof. Junmin Wang is the Lee Norris & Linda Steen Norris Endowed Professor in Mechanical Engineering at the University of Texas at Austin. In 2008, he started his academic career at Ohio State University where he was early promoted to Associate Professor in September 2013 and very early promoted to Full Professor in June 2016. In 2018, he left Ohio State and joined UT Austin as the Accenture Endowed Professor. He also gained five years of full-time industrial research experience at Southwest Research Institute (San Antonio Texas) from 2003 to 2008. Prof. Wang has a wide range of research interests covering control, modeling, estimation, optimization, and diagnosis of dynamical systems, especially for automotive, smart and sustainable mobility, human-centric automation, and cyber-physical system applications. Prof. Wang's research programs at UT-Austin and Ohio State University have been funded by federal agencies and industrial companies such as National Science Foundation (NSF), Office of Naval Research (ONR), Department of Energy (DOE), National Highway Traffic Safety Administration (NHTSA), Texas Department of Transportation, GM, Ford, Honda, Tenneco, Eaton, Ftech, Denso, and others. Dr. Wang is the author or co-author of more than 360 peer-reviewed publications including 184 journal articles and 13 U.S. patents. He is a recipient of numerous international and national honors and awards including 2019 IEEE Best Vehicular Electronics Paper Award, 2018 IEEE Andrew P. Sage Best Transactions Paper Award, 2017 IEEE Transactions on Fuzzy Systems Outstanding Paper Award, 2012 NSF-CAREER Award, 2011 SAE International Vincent Bendix Automotive Electronics Engineering Award, and 2009 ONR-YIP Award. He is an IEEE Vehicular Technology Society Distinguished Lecturer, SAE Fellow, and ASME Fellow.

Dr. Wang received the B.E. in Automotive Engineering and his first M.S. in Power Machinery and Engineering from the Tsinghua University, Beijing, China in 1997 and 2000, respectively, his second and third M.S. degrees in Electrical Engineering and Mechanical Engineering from the University of Minnesota, Twin Cities in 2003, and the Ph.D. degree in Mechanical Engineering from the University of Texas at Austin in 2007.