

Title: Towards Resource-Efficient and Secure Automated Vehicle Platoons

Keynote Speaker:

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Abstract:

Vehicle platooning has been regarded as a promising intelligent transportation system technology for achieving cooperative automated driving systems and automated highway systems due to its promising benefits, including improved road safety, highway capacity and traffic congestion relief, and reduced fuel consumption. Two critical challenges of accomplishing automated vehicle platoons are: 1) to deal with the intermittent and sporadic vehicle-to-vehicle data transmissions caused by limited wireless communication resources; and 2) to tackle the malicious cyber-attacks on the vehicle-to-vehicle communication channels.

The essentials of evolutionary platooning control technologies are first introduced for connected automated vehicles. After a brief historical background of connected automated vehicles and vehicle platooning, several key issues in the design and implementation of an automated vehicle platooning control system are elaborated. An emphasis is then placed on two emerging platooning control techniques: resource-efficient vehicle platooning and secure vehicle platooning. Furthermore, simulation and validation results under these two control techniques are presented. Finally, some challenging issues and concluding remarks are drawn.

Short Bio of Distinguished Professor



Professor Han is Pro Vice-Chancellor (Research Quality) and a Distinguished Professor at Swinburne University of Technology, Melbourne, Australia. He held various academic and management positions at Griffith University and Central Queensland University, Australia. He received the Ph.D. degree in Control Engineering from East China University of Science and Technology in 1997.

Professor Han was awarded The 2021 Norbert Wiener Award (the Highest Award in systems science and engineering, and cybernetics), The 2021 M. A. Sargent Medal (the Highest Award of the Electrical College Board of Engineers Australia), The 2021 IEEE/CAA Journal of Automatica Sinica Norbert Wiener Review Award, The 2020 IEEE Systems, Man, and Cybernetics (SMC) Society Andrew P. Sage Best Transactions Paper Award, The 2020 IEEE Transactions on Industrial Informatics Outstanding Paper Award, and The 2019 IEEE SMC Society Andrew P. Sage Best Transactions Paper Award.

Professor Han is a Member of the Academia Europaea (The Academy of Europe). He is a Fellow of The Institute of Electrical and Electronic Engineers (IEEE) and a Fellow of The Institution of Engineers

Australia. He is a Highly Cited Researcher. He has served as an AdCom Member of IEEE Industrial Electronics Society (IES), a Member of IEEE IES Fellows Committee, and Chair of IEEE IES Technical Committee on Network-based Control Systems. Currently, he is Co-Editor-in-Chief of IEEE Transactions on Industrial Informatics, Deputy Editor-in-Chief of IEEE/CAA Journal of Automatica Sinica, Co-Editor of Australian Journal of Electrical & Electronics Engineering. He has served as an Associate Editor for 12 international journals including IEEE Transactions on Cybernetics, IEEE Industrial Electronics Magazine, Control Engineering Practice, Information Sciences, and a Guest Editor for 14 Special Issues.