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Fall 2016 Colloquium

Center for Networked Computing
Computer and Information Sciences

Cyber Transportation Systems: Safety, Sustainability and Efficiency

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Tuesday, August 23, 3PM, SERC 306

Abstract: Hundreds of millions of people travel in vehicles every day. How to improve road safety and efficiency using cyber technologies (such as connected vehicles and self-driving cars) is a critical issue in today's society. We have been working on a transportation cyber physical system (CPS) project that addresses some key design and evaluation challenges in advanced cyber-transportation systems. In this talk, I will outline our effort to overcome major design and evaluation challenges related to *traffic safety,* and describe preliminary work on how to reduce accidents and in particular collisions by providing drivers with timely, and prioritized information about the road environment and collision warning messages. I will also touch upon our effort to improve sustainability and efficiency, and in particular, a testbed for evaluating and experimenting with connected and autonomous vehicles.

Bio: Chunming Qiao directs the Lab for Advanced Network Design, Analysis, and Research (LANDER), which conducts cutting-edge research with current foci on human-factors aware design and evaluation of Transportation CPS with connected and autonomous vehicle technologies, smartphone and crowd-sourcing based systems and applications, and resilience and survivability issues in virtualized datacenter and NFV environment, as well as in interdependent Power and Communications infrastructures.

He has published many papers in leading technical journals and conference proceedings, with an h-index of about 65 (according to Google Scholar) and was ranked the 77th in Top Authors in Networks and Communications (according to Microsoft Academic Search). He pioneered research on Optical Internet, and in particular, the optical burst switching (OBS). One of his earlier papers on OBS alone has been cited for more than 2500 times. In addition, his work on integrated cellular and ad hoc relaying systems (iCAR), started in 1999, is recognized as the harbinger for today's push towards the convergence between heterogeneous wireless technologies, and has been featured in BusinessWeek and Wireless Europe, as well as at the websites of New Scientists and CBC. His Research has been funded by more than a dozen of NSF grants and by major IT and telecommunications companies including Alcatel Research, Fujitsu Labs, Cisco, Google, Huawei, NEC labs, Nokia, Nortel Networks, Sprint Advanced Technology Lab, and Telcordia, as well as Industrial Technology Research Institute (in Taiwan).

Dr. Qiao has given a dozen of keynotes, and numerous invited talks on the above research topics. He has chaired and co-chaired a dozen of international conferences and workshops. He was an editor of IEEE Transactions on Networking, and Trans on Parallel and Distributed Systems, and a guest-editor or several IEEE Journal on Selected Areas in Communications (JSAC) issues. He was the chair of the IEEE Technical Committee on High Speed Networks (HSN) and the founding chair the IEEE Subcommittee on Integrated Fiber and Wireless Technologies (FiWi). He has received several best paper awards and the Distinguished Technical Achievement Award from IEEE Technical Committee on Communications, Switching and Routing. His IEEE Fellow citation is for contributions to both optical and wireless network architectures and protocols.