



**THE CHINESE UNIVERSITY OF HONG KONG**  
Department of Information Engineering  
*Seminar*

**Verifiably Safe Wireless CPS Collaborations**

**by**

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**Date : 15 Sep 2025 (Monday)**

**Time : 10:30 am – 11:30 am**

**Venue : Rm 801, Ho Sin-hang Engineering Building, CUHK**

*Abstract*

Cyber-Physical Systems (CPS) are the results of the inevitable merge of computers with other domains of physical-world practices. Many CPS applications are collaborative over wireless and are safety-critical: such as collaborative driving of Connected Autonomous Vehicles (CAVs), and collaborative medical surgeries.

However, wireless networks are intrinsically unreliable. They are challenged by malicious/unintentional jamming, large-scale path losses, multipath, handover failures etc. How to guarantee the safety of wireless CPS collaborations under the challenge of wireless network failures becomes an inevitable problem.

In this talk, we present our series of works that exploit the software design template idea and the hybrid automata formal modeling tool for CPS. We proposed various design templates for various wireless CPS collaborations. These templates are formally specified by hybrid automata, and are analytically proven to be safe under arbitrary wireless network failures.

Through this talk, we can also reveal a bigger picture for verifiably safe CPS research.

*Biography*

Qixin Wang received the Bachelor of Engineering and Master of Engineering degrees from the Department of Computer Science and Technology, Tsinghua University (Beijing, China) in 1999 and 2001 respectively; and the Ph.D. degree from the Department of Computer Science, University of Illinois at Urbana-Champaign (Illinois, USA) in 2008. He joined the Department of Computing of the Hong Kong Polytechnic University in 2009, and is now an associate professor. His research interests include cyber-physical systems, real-time/embedded systems/networks, and their applications in industrial control, medicine and assisted living. He has authored/coauthored more than 50 papers/articles in leading publication venues in these fields, including a paper winning a Distinguished Paper Award of the 47th IEEE/ACM International Conference on Software Engineering (ICSE 2025), a paper winning the 2008 Best Paper Award of the IEEE Transactions on Industrial Informatics, and a featured article paper in the IEEE Transactions on Mobile Computing 2008 May Issue. He is a member of the IEEE and ACM.

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