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Rethinking the Optimization Techniques for Real-Time Systems

Date: 27 September 2023 (Wednesday)

Time: 2:00pm - 3:00pm

Venue: Room Y6405, Yeung Kin Man Academic Building, City University of Hong Kong

ABSTRACT

Real-time systems (RTS) are embedded applications with strict timing constraints, such as automotive, robotics, and avionics. To guarantee their timing correctness, much of the effort has been dedicated to the development of validating the correctness of RTS using timing and schedulability analysis. As RTS becomes increasingly complex, there is an urgent need for efficient optimization techniques that can handle large-scale systems. This has been challenging as timing and schedulability analysis techniques are often too difficult and inefficient to use in optimization framework such as mathematical programming. Existing practice mostly relies on ad-hoc heuristics which suffer from sub-optimal solution quality and limited applicability.

In this talk, we discuss new directions for developing optimization algorithms for RTS that address the above issues. We present a number of previous studies and show that the proposed approaches have the potential to significantly improve on scalability while guaranteeing solution quality. Still, there are large grounds to be covered, which calls for participation from the research community.
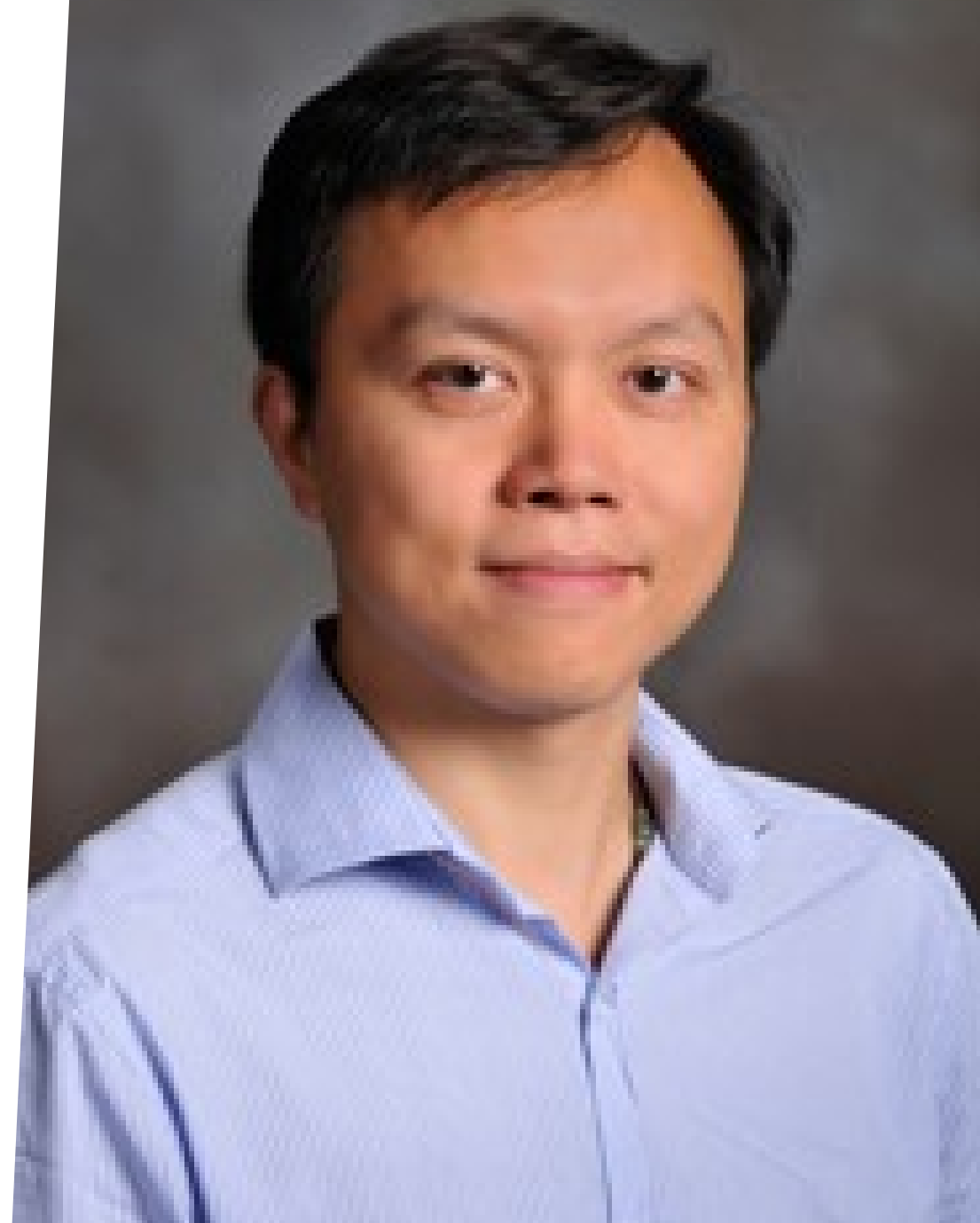
Dr Haibo ZENG

GUEST SPEAKER'S PROFILE

Dr Haibo ZENG is currently an Associate Professor at Virginia Tech, USA. He received his Ph.D. in Electrical Engineering and Computer Sciences from University of California at Berkeley, a B.E. and M.E. in Electrical Engineering from Tsinghua University, Beijing, China. He was a senior researcher at General Motors R&D until October 2011, and a faculty member at McGill University, Canada from November 2011 to August 2014. His work has received six paper awards, including those at flagship conferences on real-time systems (RTSS'20, RTSS'17 and ECRTS'13).

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All are welcome