电 气 工 程 学 院 讲 座

Towards Synthesis of Divide-and-Conquer Reductions for Parallel Verification

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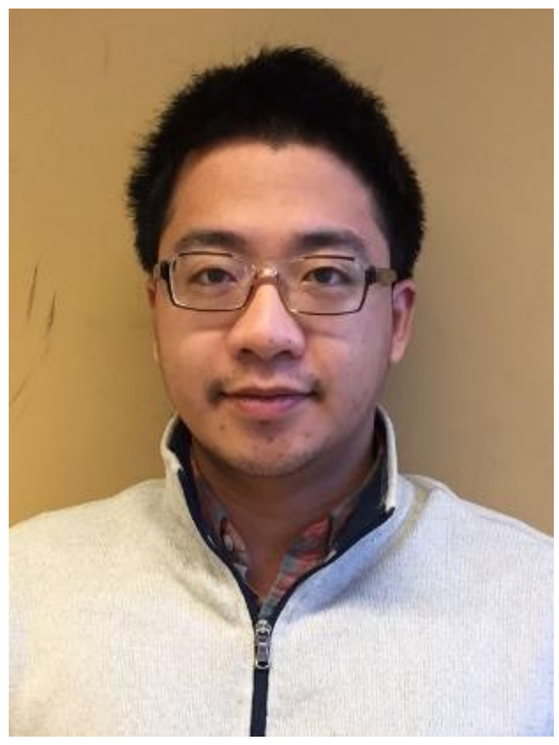
Abstract: The problem of automatic computation of complexity-theoretic reductions has important applications in automatic programming and addressing open questions about the relations between complexity classes. A particularly interesting reduction is the divide-and-conquer reduction that reduces a problem instance to a set of smaller problem instances over the same structure. A divide-and-conquer reduction may provide significant complexity improvement, which would be hard to discover otherwise, over state-of-the-art algorithms and allow easy parallelization of the algorithm. In this talk, we present our current progress in the synthesis of divide-and-conquer reductions, in particular for those model-checking problems with an order structure. We will draw upon our recent works on automatic generation of (optimal) reductions of distributions for parallel verification of language decomposability, where computing optimal reductions correspond to discovering optimal complexity reduction within this framework. We will provide an introduction to language decomposability, which is a useful property in the distributed supervisory control of discrete-event systems.

Biography: Liyong Lin received the B.E. and Ph.D. degrees in electrical engineering from Nanyang Technological University, Singapore, in 2011 and 2016, respectively. He has worked as a Postdoctoral Fellow at the University of Toronto, Canada, from 2016 to 2017. He is now a Postdoctoral Fellow at the Nanyang Technological University, Singapore. His main research interests include supervisory control theory and formal methods.



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