Title: A linear-time algorithm for the orbit problem over cyclic groups

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Chaired by: Dr Jaffar, Joxan, Professor, School of Computing
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Abstract:

The orbit problem is at the heart of symmetry reduction methods for model checking concurrent systems. It asks whether two given configurations in a concurrent system (represented as finite sequences over some finite alphabet) are in the same orbit with respect to a given finite permutation group (represented by their generators) acting on this set of configurations. It is known that the problem is in general as hard as the graph isomorphism problem, which is widely believed to be not solvable in polynomial time. In this talk, we consider the restriction of the orbit problem when the permutation group is cyclic (i.e. generated by a single permutation), an important restriction of the orbit problem. The main result is a linear-time algorithm for this subproblem. This work, joint with Sanming Zhou (University of Melbourne), will be presented in CONCUR’14.

Short bio:

Dr. Anthony Lin is an assistant professor in computer science at Yale-NUS College. He completed his PhD at Edinburgh's University School of Informatics under Prof. Leonid Libkin and Dr. Richard Mayr. Previously, he was an EPSRC Postdoctoral Research Fellow at University of Oxford (2010-2013). His main research focuses on algorithmic program verification, language-based security, and automata theory.