Title: **Blitz: Compositional Bounded Model Checking for Real-World Programs**

Speaker: Dr. Cho Chia Yuan  
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Chaired by: Dr Roychoudhury, Abhik, Associate Professor, School of Computing  
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**Abstract:**  
Bounded Model Checking (BMC) for software is a precise bug-finding technique that builds upon the efficiency of modern SAT and SMT solvers. BMC currently does not scale to large programs because the size of the generated formulae exceeds the capacity of existing solvers. We present a new, compositional and property-sensitive algorithm that enables BMC to automatically find bugs in large programs. One novel feature of our technique is decomposing the behaviour of a program into a sequence of BMC instances and use a combination of satisfying instances and unsatisfiability proofs to propagate information across instances. A second novelty is to use the control- and data-flow of the program as well as information from proofs to prune the set of variables and procedures considered and hence, generate smaller instances. Our tool Blitz significantly outperforms existing tools and scales to programs with over 100,000 lines of code. Blitz automatically and efficiently discovers bugs in widely deployed software including new vulnerabilities in Internet infrastructure software.

**Biodata:**  
Chia Yuan is a senior scientist at DSO National Laboratories, Singapore. He works on applying automated reasoning techniques to software and systems security. He obtained his PhD from the University of California, Berkeley in December 2013, under the DSO PhD Scholarship. Prior to his PhD, his work in DSO has led to several awards, including a DSO Intellectual Property (Trade Secret). He was a recipient of the DSTA Scholarship for B.Eng. (First Class Honours) and M.Eng. (Accelerated Masters Programme) at NUS.