The Johns Hopkins University
Whiting School of Engineering
Department of Electrical and Computer Engineering

Taming Concurrency

A Seminar by

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Abstract: Concurrency is all pervasive from cell phones to data-centers. However, concurrent programming continues to be a daunting task to this day even for experts. Popular concurrent languages like C++ and Java do not make a programmer's life any easier by subverting even the most rudimentary semantics, such as that of a semi-colon. They no longer guarantee that "A; B" means "perform A and then B" during concurrent computation. Tools such as deterministic replayers and data-race detectors can help, but these tools are too slow to use routinely. In this talk, I will discuss how we can solve some of these fundamental challenges in concurrent programming by rethinking the roles of hardware, compiler and operating system.

I will also touch upon our ongoing BigCode project. By learning from a large corpus of source code, BigCode aims to help teach massive open online courses through "peer debugging", and also enable next generation productivity tools such as voice programming and auto-complete.

Bio: Satish Narayanasamy is an Associate Professor in the EECS Department at the University of Michigan, where he joined in 2008. He works at the intersection of computer architecture, software systems and program analysis. He has led several impactful research projects including multiprocessor deterministic replay systems, concurrency tools, and language-level memory models. His research helped create the PinPlay replay system that is being used at Intel for processor simulations and debugging, and a data-race classifier at Microsoft. He has received several awards including the Google Faculty award (2014), NSF CAREER (2012), best paper award at the ASPLOS (2011), and three IEEE MICRO Top Picks awards (2005, 2006, 2012). He was named the Morris Wellman Faculty Development Assistant Professor of CSE at the University of Michigan in 2014.

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