

**THE DEPARTMENT OF COMPUTER SCIENCE & THE COMPUTER SCIENCE
GRADUATE STUDENT ORGANIZATION (GSOCS) PRESENT**

INVITED SPEAKER SERIES

**Professor Stephen Chong
Harvard University**

Friday, April 20th at 12 noon, Engineering Building Room 110

Software contracts for fun and profit (and security and microservices)

Abstract: Software contracts are executable specifications of functions, i.e., function specifications that can be checked at runtime. Software contracts can check specifications of programs and provide feedback to developers when programs fail to meet their specification. In this talk, I'll discuss two novel uses of software contracts: enforcing access control requirements, and checking specifications for microservices.

We develop an expressive framework for implementing access control monitors for components. Software components have a wide variety of access control requirements, and a one-size-fits-all access control framework will not meet the needs of all of them. The basis of the framework is a novel concept: the authority environment. An authority environment associates rights with an execution context. The building blocks of access control monitors in our framework are authorization contracts: software contracts that manage authority environments.

We also develop Whip, a system that brings the benefits of software contracts to microservices. Whip provides programmers with a contract language tailored to the needs of modern services, and monitors services at run time. Contract monitoring is local to a service and services are treated as black boxes, allowing heterogeneous implementation languages without modification to services' code. Thus, Whip does not disturb the loosely coupled nature of modern services.

This talk is based on joint work with Lucas Waye, Scott Moore, Christos Dimoulas, Matthew Flatt, and Robert Bruce Findler.

Bio: Stephen Chong is a Gordon McKay Professor of Computer Science in the Harvard John A. Paulson School of Engineering and Applied Sciences. Steve's research focuses on programming languages, information security, and the intersection of these two areas. He is the recipient of an NSF CAREER award, an AFOSR Young Investigator award, and a Sloan Research Fellowship. He received a PhD from Cornell University, and a bachelor's degree from Victoria University of Wellington, New Zealand.