Position Available: Ph.D. Candidate

Comprehensive Security Assurance Solutions for Software-Dependent Systems

The Cyber Security Evaluation and Assurance (CyberSEA) Research Lab at Carleton University is actively looking for multiple graduate students at the Doctoral level to contribute to a funded research program developing Comprehensive Security Assurance Solutions for Software-Dependent Systems starting in September 2019 or January 2020.

Project Description

The overall aim of this research program is to establish comprehensive security assurance solutions by enhancing security-by-design approaches for engineering secure software-dependent systems. More specifically, it aims to develop more incremental, modular, and compositional solutions for securing systems from the outset and for generating sufficient evidence of their built-in resilience to a range of cyber-attacks and failures. This requires the integration of formal (mathematically rigorous) methods and security-by-design approaches to provide verifiable evidence to support security assurance claims from early stages of system development. We will achieve this by:

(1) Developing formal modeling and analysis frameworks with which we can provide mathematical proofs of assurance of security properties of software-dependent systems at early stages of development;

(2) Establishing system-level security evaluation methods and techniques for understanding and mitigating the risks to system assets posed by identified security vulnerabilities; and

(3) Advancing techniques to support the management, evaluation, and presentation of sufficient evidence for developing incremental security assurance cases.

Projects related to the research program described above will be eligible for funding in the form of a research assistantship.

Duties and Responsibilities

As part of the Doctoral Program requirements, candidates will complete a dissertation on a topic aligned with the research mission of the CyberSEA Research Lab including but not limited to: cybersecurity evaluation and assurance, threat modeling, risk assessment and management, modelling and simulation for security, software engineering, distributed systems, and/or formal methods for security.

Desired Skills/Qualifications

Suitable candidates will have a Master’s degree in Software Engineering, Computer Science, or a related field. Ideal candidates will be self-motivated with an ability to work independently and to communicate effectively in a team environment. A background in computer security, software engineering concepts, and logic and discrete mathematics is highly desirable. Experience with formal specification and verification using fundamental tools such as first-order or temporal logic, model checkers, and/or theorem provers is considered an asset.

All candidates must satisfy the Minimum Admission Requirements for Doctoral Programs at Carleton University.
Further Information
For more information about Graduate Studies at Carleton University and the Department of Systems and Computer Engineering, please visit: https://carleton.ca/sce/graduate-studies/. For more information about applying for Graduate Studies at Carleton University, please visit: https://graduate.carleton.ca/apply-online/. For more information about funding for Graduate Studies, please visit: https://graduate.carleton.ca/financial-assistance/admissions-funding/.

About the CyberSEA Research Lab
The Cyber Security Evaluation and Assurance (CyberSEA) Research Lab conducts advanced academic research to develop systematic and rigorous approaches for evaluating and assuring the cyber security of software-dependent systems. For more information, please visit: https://carleton.ca/cybersea/

How to Apply
Interested applicants are to send a CV and Statement of Interest detailing your research interests, background, and experience by email to the CyberSEA Lab Director:

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For more information about how to apply, please visit: https://carleton.ca/cybersea/positions-available/