



CyberSEA
Research Lab
Carleton University



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Systems and Computer Engineering

Carleton University

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Ottawa, ON K1S 5B6

November 15, 2023

Position Available: Ph.D. Candidate

An Active Security Risk Management System for Standards Compliance

The **Cyber Security Evaluation and Assurance (CyberSEA) Research Lab** at Carleton University is actively looking for graduate students at the Doctoral level to contribute to a funded research project starting in September 2024.

Project Description

Cyber security standards and guidelines related to secure system development and management play a critical role in security assurance, certification, and evaluation. Effective security assurance often demands compliance with domain-relevant cyber security standards. However, security standards compliance is difficult and time consuming. New ways to identify potential compliance issues early and in a more automated and predictive way are needed to save on the effort required in security compliance activities and to establish traceability links for security assurance activities. This project aims to develop a way to predict the need for stronger asset protections (i.e., potential compliance issues/risks) in support compliance with cyber security standards and regulations. To address these challenges, we seek to develop a risk management system that can scan source code and/or project files to identify patterns at relatively early stages of a project that can:

- (1) Predict potential security compliance issues and possible risks requiring asset protections;
- (2) Identify parts of the code/project that are compliant with a set of security compliance requirements;
- (3) Suggest solutions (asset protection requirements) to address identified issues.

Project Keywords:

- security evaluation
- security assurance
- standards
- regulations
- security policy
- risk assessment
- software engineering
- data science

Related Literature References

- [1] Q. Rouland, S. Gjorcheski, and J. Jaskolka. **A security compliance-by-design framework utilizing reusable formal models**. In *23rd IEEE International Conference on Software Quality, Reliability, and Security, QRS 2023*, pages 1–10, Chiang Mai, Thailand, 2023. (To Appear).
- [2] Q. Rouland, S. Gjorcheski, and J. Jaskolka. **Eliciting a security architecture requirements baseline from standards and regulations**. In *2023 IEEE 31st International Requirements Engineering Conference Workshops, REW*, pages 224–229, Hannover, Germany, 2023.
- [3] J. Jaskolka. **Recommendations for effective security assurance of software-dependent systems**. In K. Arai, S. Kapoor, and R. Bhatia, editors, *Intelligent Computing, SAI 2020*, volume 1230 of *Advances in Intelligent Systems and Computing*, pages 511–531. Springer, Cham, July 2020.

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 processes and concepts, and software/system requirements, and machine learning approaches and techniques is highly desirable. Familiarity and/or experience with cyber security standards is considered an asset.

All candidates must satisfy the [Minimum Admission Requirements for Doctoral Programs](#) at Carleton University. International candidates must also ensure that they satisfy the [English as a Second Language Requirements](#). In all cases, these requirements will be strictly enforced when evaluating an application for admission.

Funding

Successful candidates for this position will be *eligible for funding* in the form of a research assistantship. Specific funding details are determined at the time of offer and consider numerous factors such as academic standing, research potential, availability of funds, eligibility for teaching assistantship and/or scholarships, etc.

Host Research Institute Information

[Carleton University](#) is a public comprehensive university, founded in 1942, in Ottawa, Ontario, Canada. The research-intensive Faculty of Engineering and Design at Carleton University is recognized as one of Canada's leading institutions in the study and research of engineering, architecture, industrial design and information technology. Since the inception of engineering at Carleton in 1945, our experts have pushed the bounds of innovation and discovery. Carleton focuses on anticipating the needs of industry and society, and offers forward-thinking programs with real world application and produces research that is helping to shape our present and future. The [Department of Systems and Computer Engineering](#) is a recognized world-class institution in software engineering, computer systems engineering, communications engineering, and biomedical engineering. Together with the Department of Electronics, the Department of Systems and Computer Engineering constitutes one of the largest and most research-intensive centres for Electrical and Computer Engineering and Software Engineering education and research in Canada. 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.

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/>.

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:

Jason Jaskolka, Ph.D., P.Eng.

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

Application Deadline

Applications will be reviewed as they arrive until a suitable candidate is found.