PhD POSITION IN DISTRIBUTED APPLICATIONS AND CLOUD COMPUTING

POSITION OVERVIEW:

We are seeking a highly motivated PhD student to join a research project focused on the monitoring and debugging of container-based micro-services applications in cloud environments. This position will be hosted at Polytechnique Montréal, co-supervised by Professor Foutse Khomh (Polytechnique Montréal) and Professor Naser Ezzati-Jivan (Brock University). The project aims to address the challenges in debugging performance issues in distributed applications deployed in the cloud.

PROJECT DESCRIPTION:

Distributed applications are commonly deployed in the Cloud, using modular micro-services within various frameworks such as virtual machines, orchestrated containers, messaging middleware, and language runtimes. The complexity of these environments makes debugging performance issues challenging, especially at the intersections of multiple layers. This project aims to:

- Study the deployment environment of new distributed applications.
- Examine problems and shortcomings of current monitoring and diagnostic tools.
- Propose specific instrumentation to track interactions between micro-services across various layers.
- Develop algorithms for analyzing these interactions.
- Create graphical views to display these interactions.

The successful candidate will collaborate with industry partners such as Ciena and Ericsson to develop a comprehensive instrumentation and analysis framework for distributed micro-services applications.

QUALIFICATIONS:

- A Master's degree in Computer Science, Software Engineering, or a closely related field.
- Strong foundation in cloud computing, distributed systems, and micro-services architecture.
- Experience with virtualization technologies (e.g., KVM), container orchestration tools (e.g., Kubernetes, Docker), and messaging middleware (e.g., ZeroMQ).
- Proficiency in programming languages such as Java, JavaScript, or Python.
- Familiarity with debugging and performance analysis tools.
- Excellent problem-solving skills and the ability to work independently as well as in a collaborative environment.
- Strong communication skills in English.
- Motivation to work in an interdisciplinary and industrial collaboration setting.

FUNDING:

This position is fully funded.

HOW TO APPLY:

Interested applicants should send their applications to Professor Foutse Khomh (foutse.khomh@polymtl.ca) OR Professor Naser Ezzati-Jivan (nezzati@brocku.ca) using the subject line 'PhD Application – Distributed Applications'. A complete application should include:

- A cover letter describing your research interests relative to the above topics and your motivation for applying.
- Curriculum Vitae (CV) including a complete list of publications (evidence of publications is desirable but not mandatory) and contact information for three references.
- Copies of BSc and MSc transcripts.

EQUAL ACCESS EMPLOYMENT PROGRAM:

Our institutes are dedicated to promoting diversity and inclusion. We encourage applications from women, Indigenous peoples, visible minorities, ethnic minorities, and individuals with disabilities. We will accommodate the specific needs of applicants with disabilities upon request. We also welcome candidates of all sexual orientations and gender identities.