University of Victoria | Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

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"Identifying Communications of Running Programs through Their Assembly Level Execution Traces"

Department of Computer Science

Friday, May 11, 2018
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Engineering and Computer Science Building
Room 467

Supervisory Committee:
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Dr. Margaret-Anne Storey, Department of Computer Science, UVic (Member)

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Dr. Sylvia Pantaleo, Department of Curriculum and Instruction, UVic

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Abstract

Understanding the communications between programs can help software security engineers understand the behaviour of a system and detect vulnerabilities in a system. Assembly-level execution traces are used for this purpose for two reasons: 1) lack of source code of the running programs, and 2) assembly-level execution traces provide the most accurate run-time behaviour information. In this thesis, I present a communication analysis approach using such execution traces. I first model the message based communication in the context of trace analysis. Then I develop a method and the necessary algorithms to identify communications from a dual trace which consist of two assembly level execution traces. A prototype is developed for communication analysis. Finally, I conducted two experiments for communication analysis of interacting programs. These two experiments show the usefulness of the designed communication analysis approach, the developed algorithms and the implemented prototype.