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

of

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“A Framework for Measuring Organizational Information Security Vulnerability”

Department of Computer Science

Wednesday, October 23, 2019
11:00 A.M.
Engineering / Computer Science Building
Room 467

Supervisory Committee:
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Dr. Sudhakar Ganti, Department of Computer Science, UVic (Member)

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Dr. Kin Fun Li, Department of Electrical and Computer Engineering, UVic

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Abstract

In spite of the ever-growing technology in information security, organizations are still vulnerable to security attacks due to mistakes made by their employees. To evaluate organizational security vulnerability and keep organizations alert on their security condition, we developed a framework for measuring the security vulnerability of organizations based on online behaviours analysis of their employees. In this framework, the behavioural data of employees for their online privacy are taken as input, and the personal vulnerability profiles of them are generated and represented as confusion matrices. Then, by incorporating the personal vulnerability data into the local social network of interpersonal security influence in the workplace, the overall security vulnerability of each organization is evaluated and rated as a percentile value representing its position to all other organizations. Through evaluation with real-world data and simulation, this framework is verified to be both effective and efficient in estimating the actual security vulnerability status of organizations. Besides, a demo application is developed to illustrate the feasibility of this framework in the practice of improving information security for organizations.