

**School of Interactive Arts and Technology (SIAT)
Faculty of Applied Science**

THESIS DEFENCE

LAST NAME: JIANG FIRST NAME: Congcong (Coco)
PROGRAM: Master of Science, Program
DATE: September 24, 2009
LOCATION: SFU Surrey Campus, Central City Tower, 14th Floor, SC 14-400
TIME: 10:00 AM to 12:30 PM
THESIS TITLE: An Information Model for Visualizing Critical Infrastructure Interdependencies

EXAMINING COMMITTEE

	Name	Rank	Department/Institution
CHAIR	<u>Dr. Marek Hatala, Associate Professor, School of Interactive Arts and Technology</u>		
SENIOR SUPERVISOR	<u>Dr. Lyn Bartram, Assistant Professor, School of Interactive Arts and Technology</u>		
SUPERVISOR	<u>Dr. John Dill, Professor Emeritus, School of Interactive Arts and Technology</u>		
INTERNAL EXAMINER	<u>Dr. Rob Woodbury, Professor, School of Interactive Arts and Technology</u>		
EXTERNAL EXAMINER	<u></u>		

CREDENTIALS

Date	Degree	Field of Study	Institution
<u>2005</u>	<u>B. Comp.</u>	<u>Computer Science</u>	<u>Queen's University</u>
<u></u>	<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>	<u></u>

AWARDS

Date	Award Name
<u>2006</u>	<u>Faculty of Applied Sciences Graduate Fellowship</u>
<u></u>	<u></u>

THESIS DEFENCE

ABSTRACT

TITLE An Information Model for Visualizing Critical Infrastructure Interdependencies

Critical infrastructures such as electricity, water, telecommunication, transportation and medical services are complex networks of interconnected and interdependent components. Identifying, understanding and managing the interdependencies between critical infrastructures are new challenges for emergency management. I2C JIIRP (Joint Infrastructure Interdependencies Research Program) is a multidisciplinary project that studies new simulation approaches and techniques to analyze critical infrastructure interdependencies. This thesis research is part of the visualization research of the I2C JIIRP research project.

In this thesis, I propose an information model for the external user interface of the prototype simulator. I explore ways to visualize interdependencies, capture missing knowledge, support shared understanding and assist decision-making between infrastructure managers during the response phase and short-term recovery phase of emergency management. To demonstrate the visual model, I walk through the I2sim 5-cell test case with 2006 UBC (University of British Columbia) campus power shortage scenario to showcase the problems and solutions. At the end, I further discuss how the information model might support emergency management work from three user perspectives: planning, analysis and reaction.