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COLLEGE OF ENGINEERING & COMPUTER SCIENCE
Florida Atlantic University

THE FLORIDA ATLANTIC UNIVERSITY

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

announces the

Ph.D. Dissertation Defense

of

INGRID BUCKLEY

for the degree of

DOCTOR OF PHILOSOPHY (PH.D.)

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Boca Raton, FL

DEPARTMENT: COMPUTER & ELECTRICAL ENGINEERING and COMPUTER SCIENCE

DISSERTATION TITLE: "TOWARDS A METHODOLOGY FOR BUILDING RELIABLE SYSTEMS"

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ABSTRACT OF DISSERTATION

TOWARDS A METHODOLOGY FOR BUILDING RELIABLE SYSTEMS

Reliability is a key system characteristic that is an increasing concern for current systems. Greater reliability is necessary due to the new ways in which services are delivered to the public. Services are used by many industries, including health care, government, telecommunications, tools, and products. We have defined an approach to incorporate reliability along the stages of system development. We first did a survey of existing dependability patterns to evaluate their possible use in this methodology. We have defined a systematic methodology that helps the designer apply reliability in all steps of the development life cycle in the form of patterns. A systematic failure enumeration process to define corresponding countermeasures was proposed as a guideline to define where reliability is needed. We introduced the idea of failure patterns which show how failures manifest and propagate in a system. We also looked at how to combine reliability and security. Finally, we defined an approach to certify the level of reliability of an implemented web service. All these steps lead towards a complete methodology.

BIOGRAPHICAL SKETCH

Born in **JAMAICA**
B.S. **MAY 2004, UNIVERSITY OF TECHNOLOGY, JAMAICA**
M.S. **DECEMBER 2008, F LORIDA ATLANTIC UNIVERSITY**

QUALIFYING EXAMINATION & PUBLICATIONS

Time in Preparation: 3 YEARS

Qualifying Examination Passed: Spring 2010

Selected Publications:

- I. A. Buckley, E. B. Fernandez, "Failure Pattern: A New Approach to Analyze Failures", submitted for publication to the *Technical Symposium on Software Architecture and Patterns conference*, *LACCEI 2012*, July 23 -27, 2012.
- Eduardo B. Fernandez , Ola Ajaj, Ingrid Buckley, Nelly Delessy, Keiko Hashizume, Maria M. Larrondo-Petrie, "A Pattern Language for Web Services Security and Reliability", accepted (in revision) for Future Internet.
- I. Buckley, E. B. Fernandez, "Enumerating Software Failures to Build Dependable Distributed Applications", Procs. of 13thIEEE High Assurance Systems Engineering (HASE 2011), International Symposium, Boca Raton, November 10-12, 2011.
- I. Buckley, E. B. Fernandez, M. M. Larrondo-Petrie, "Patterns Combining Reliability and Security", Procs. of PATTERNS 2011: The Third International Conferences on Pervasive Patterns and Applications, 144-150, Rome, Italy, September , 25-30, 2011.
- I. Buckley, E. B. Fernandez, M. Anisetti, C. A. Ardagna, M. Sadjadi, E. Damiani, "Towards Pattern-based Reliability Certification of Services", Procs. of 1st International Symposium on Secure Virtual Infrastructures (DOA-SVI'11) OTM 2011, Part II, LNCS 7045, 558–574, 2011.
- I. Buckley and E. B. Fernandez, "Three patterns for fault tolerance", Procs. of OOPSLA MiniPLoP, October 26, 2009.
- I. Buckley, E. B. Fernandez, G. Rossi, M. Sadjadi, "Web Services Reliability Patterns", short paper in the 21st Internatio al Conference on Software Engineering and Knowledge Engineering (SEKE'2009), Boston, July 1-3, 2009.
- E. B. Fernandez, K. Hashizume, I. A. Buckley, M. M. Larrondo-Petrie, M. VanHilst, "Web Services Security: Standards and Products," in "Web Services Security Development and Architecture: Theoretical and Practical Issues", Carlos A. Gutierrez, Eduardo Fernandez-Medina, and Mario Piattini (Eds.), IGI Global 2009.