# Matthew Stephan

Ph.D. Candidate and Adjunct Lecturer
Queen's University
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**Research Interests**

Software Engineering, Software Modeling and Systems,
Static Analysis, Domain Specific Languages,
Software Quality and Testing

**Education**

**Queen's University**
Ph.D. Candidate, Computer Science, July 2014 (Expected).
Advisor: Professor Jim Cordy
Thesis: Using Mutation Analysis for a Model-Clone Detector Comparison Framework

**University of Waterloo**
MASc., Electrical and Computer Engineering (Computer Software), April 2009.
Advisor: Professor Krzysztof Czarnecki
Thesis: Detection of Java EE EJB Antipattern Instances using Framework-Specific Models

**University of Waterloo**
BSE., Software Engineering Coop Program, April 2007.

**Awards and Honours**

Ontario Graduate Scholarship; $15,000; 2013-2014
NSERC PGS D3 Scholarship Holder; $63,000; 2010-2013
Best Paper Award, Modelsward 2013
Queen's Graduate Award, $1000; 7x, 2011-present
University of Waterloo Graduate Scholarship, Winter 2009
Class Valedictorian, Thornhill Secondary School, 2002

**Teaching Experience**

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| January 2013 – April 2013 | **Course Instructor,** Queen's University.<br>Course: Fundamentals of Information Structures and Software Engineering |
| Sept. 2012 – Dec. 2012 | **Course Instructor**, Queen's University.<br>Course: Operating Systems |
| January 2012 – April 2012 | **Teaching Assistant**, Queen's University.<br>Instructor: Janice Glasgow<br>Course: Logic for Computing Science |
| January 2011 – April 2011 | **Teaching Assistant**, Queen's University.<br>Instructor: Alan McLeod<br>Course: Fundamentals of Software Development |

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| Sept. 2010 – Dec. 2010 | **Teaching Assistant**, Queen's University.<br>Instructor: Alan McLeod<br>Course: Computing Science for Engineers |
| January 2010 - April 2010 | **Teaching Assistant**, Queen's University.<br>Instructor: Alan McLeod<br>Course: Introduction to Computing Science II |
| December 2007 - April 2008 | **Teaching Assistant**, University of Waterloo.<br>Instructor: Paulo Alencar<br>Course: Software Testing & Quality Assurance |
| Fall 2007, Fall 2008 | Created and presented lecture on Object-Oriented Programming for Graduate Course, *Fundamentals of Software Engineering*, intended to provide an introduction to and overview of Object-Oriented Programming |

**Research Experience**

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| September 2009 – Present | **Research Assistant**, Queen's University.<br>Developed a near-miss model-clone detector, Simone, as part of a team of five researchers. My main contributions included 1) doing all of the investigative research beforehand on model comparison and model-clone detection in order to identify research directions, 2) assisting with tool development, 3) being charged with evaluation of the tool and comparison with other tools. This included working with industrial partners, looking at real data sets, assessing their needs and desires, and frequently organizing and presenting our results. |
| September 2007 – April 2009 | **Research Assistant**, University of Waterloo.<br>Concluded investigation of Ecore class and instance models to feature models and configurations, respectively, yielding a technical report and completed Eclipse plugin, Ecore.FMP. Developed a domain specific modeling language (DSML) that formalized the Java EE EJB Architecture concepts to provide a runtime view of EJB projects and detect antipattern instances. Entailed use of model analysis, extending DSML infrastructure, formalization of EJB configuration rules, and domain analysis and modeling. |
| Sept. 2006 – Dec. 2006 | **Research Assistant Co-op Student**, University of Waterloo.<br>Created an Eclipse plugin that transforms Ecore models into feature models and vice versa. Began investigation of mapping of Ecore Class and instance models to feature models and configurations, respectively. |

**Referred Publications**

M. Stephan, M. Alafi, J.R. Cordy, "Towards a Taxonomy for Simulink Model Mutations", International Conference on Software Testing, Verification, and Validation 2014 (ICST) – Mutation Workshop, March 2014, pages 206-215.

M. Stephan, M. Alafi, A. Stevenson, J. R. Cordy, "Evolution of Model Clones in Simulink", Models 2013 - Models and Evolution, Sept 2013, pages 38-47. **(Selected for JSS special issue Journal extension)**

M. Stephan, M. Alafi, A. Stevenson, J. R. Cordy, "Using Mutation Analysis for a Model-Clone Detector Comparison Framework" , International Conference on Software Engineering (ICSE) - NIER Track, San Francisco, USA, May 2013, pages 1261-1264. (22% acceptance rate out of 143 papers)

M. Stephan and J.R. Cordy, "A Survey of Model Comparison Approaches and Applications", Proc. Modelsward 2013, International Conference on Model-Driven Engineering and Software Development, Barcelona, Spain, February 2013, pages 265-277. **Best Paper Award**. (11% full paper acceptance ratio)

M. Stephan and J.R. Cordy, "Application of Model Comparison Techniques to Model Transformation Testing", Proc. Modelsward 2013, 1st International Conference on Model-Driven Engineering and Software Development, Barcelona, Spain, February 2013, pages 307-311.

M. Alalfi, J.R. Cordy, T.R. Dean, M. Stephan and A. Stevenson, "Models are Code Too: Near-miss Clone Detection for Simulink Models", Proc. ICSM 2012, IEEE 28th International Conference on Software Maintenance, Riva del Garda, Italy, September 2012, pages 295-304. (25% acceptance rate)

M. Stephan , M. Alalfi, A. Stevenson and J.R. Cordy, "Towards Qualitative Comparison of Simulink Model Clone Detection Approaches", Proc. IWSC 2012, ICSE 6th International Workshop on Software Clones, Zürich, Switzerland, June 2012, 84-85.

M. Alalfi, J.R. Cordy, T.R. Dean, M. Stephan and A. Stevenson, "Near-miss Model Clone Detection for Simulink Models", Proc. IWSC 2012, ICSE 6th International Workshop on Software Clones, Zürich, Switzerland, June 2012, 78-79.

Michał Antkiewicz, Krzysztof Czarnecki, Matthew Stephan, "Engineering of Framework-Specific Modeling Languages," IEEE Transactions on Software Engineering, November 2009, pp. 795-824.

M. Stephan, "Detection of Java EE EJB Antipattern Instances using Framework-Specific Models," Master's thesis, University of Waterloo, 2009.

**Technical Reports**

Matthew Stephan and James R. Cordy "A Survey of Methods and Applications of Model Comparison", School of Computing, Queen's University, Tech. Rep. #2011-582, 2011. 43 pages.

Matthew Stephan and Michał Antkiewicz. Ecore.fmp: A tool for instantiating class models as feature models. Technical Report 2008-08, Electrical and Computer Engineering, University of Waterloo, 2008.

**Other Presentations**

Matthew Stephan, Manar Alalfi, James Cordy, Tom Dean, Andrew Stevenson "A Comparison Framework for Simulink Model Clone Detection", Poster at Cascon 2012.

Matthew Stephan. Presentation and poster at IBM Centre for Advanced Studies Student Day: "Discovery of Java EE 5 Antipatterns using Framework-Specific Models".

**Professional Service and Memberships**

ACM Professional Member

Reviewer

- Currently Reviewing SOSYM Journal
- ICPC 2013
- Science of Computer Programming Journal 2013
- SLE 2013
- ICSM 2012
- Empirical Software Engineering Journal no. 10664, 2012
- International Conference on Model Transformation (ICMT) 2011
- SCAM 2011
- CASCON 2011
- Software Maintenance and Reengineering (CSMR) 2010
- International Conference on Program Comprehension (ICPC) 2010
- International Conference on Software Maintainence (ICSM) 2010
- International Working Conference on Source Code Analysis and Manipulation (SCAM) 2010

**Mentoring Experience**

Summers 2007, 2008, 2009, 2010, 2011, 2012, 2013

**Head Staff,** Camp Winnebagoe
Responsible for upwards of 16 staff and 90 campers belonging to my assigned unit. Mentor and teach staff to become better counselors and perform formal evaluations twice a summer. Required to frequently speak in front of 300+ campers and staff.

September 2009 – Present

**Chapter Advisor,** Alpha Epsilon Pi.
Continually guide and mentor the chapter's executive board on how to plan, organize, and develop successful philanthropic, networking, and other ventures. Often give talks to chapters of 50-100 members on general chapter operations and provide specific advice.

**Industrial Experience**

January 2006 – April 2006 — **Systems Analyst Co-op**, Deloitte Inc., Toronto, Canada.

May 2005 - August 2005 — **Software Engineering Co-op,** Visa International, San Jose, California.

Sept. 2004 - Dec. 2004, May 2003 - August 2003 — **Software Developer Co-op,** CheckFree Corporation, Waterloo, Canada.

January 2004 - April 2004 — **JR PC/Client Server Developer,** Canadian Imperial Bank of Commerce, Toronto, Canada.

**Interests** — Health & Fitness, Social Media, Baseball and Football Statistics

**Citizenship** — Canadian

**References** — Available upon request