

Dr. Matthew Stephan

Assistant Professor (Associate Professor starting July 2021)

Miami University

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Summary of Qualifications

- Over \$290,000 (CDN) in external funding, and over \$68,000 (CDN) internal funding
- More than 600 citations, i10-index of 17, and h-index of 13 (Google Scholar)
- Overall course evaluation average of 3.56/4 (2.96/4 department average during same time)
- 2 Years Industry (Co-op) Experience including financial, consulting, and software companies
- External Service – Program Chair x 1, Organizing Committee x 2, and Program Committee x 13

Education

Ph.D., Computer Science **2009 – 2014**

Queen's University, Kingston, Ontario, Canada

Advisor: Professor Jim Cordy

Thesis: A Mutation Analysis Based Model Clone Detector Evaluation Framework

MAsc., Electrical and Computer Engineering (Computer Software) **2007 – 2009**

University of Waterloo, Waterloo, Ontario, Canada

Advisor: Professor Krzysztof Czarnecki

Thesis: Detection of Java EE EJB Antipattern Instances using Framework-Specific Models

BSE., Software Engineering Coop Program **2002 – 2007**

University of Waterloo, Waterloo, Ontario, Canada

Research Experience

Assistant Professor (Associate Professor starting July 2021) **2015 – Present**

Department of Computer Science and Software Engineering

Miami University, Oxford, Ohio, United States

Visiting Assistant Professor **2014 – 2015**

Department of Computer Science and Software Engineering

Miami University, Oxford, Ohio, United States

Undergraduate Research Assistant **2006**

Faculty of Engineering

University of Waterloo, Waterloo, Ontario, Canada

Awards and Honours

- National Science Foundation (NSF) Grant #1849632 CRII: SHF: Towards a Cognizant Virtual Software Modeling Assistant using Model Clones; **\$161,861.00 USD**; 2019

- "Beacon-Based Large Touch Screens for Student Team Collaboration and Learning", Miami University Student Tech Fee; ~\$10,300 USD; 2017
- "Realization of Model Driven Engineering for Big Data: A Model-Driven Framework for Machine Learning Baseball Analytics", Miami University Committee for Faculty Research; \$24,724 USD; 2017
- "Increasing Efficiency and Effectiveness of Learning for CS & SE Students Through Multiple Monitors", Miami University Student Tech Fee; ~\$18,000 USD; 2016
- NSF ICSE 2016 Early-Career Faculty Travel Award; ~\$2,000 USD; 2016
- Ontario Graduate Scholarship; \$15,000 CDN; 2013-2014
- NSERC PGS D3 Scholarship Holder; \$63,000 CDN; 2010-2013
- Best Paper Award, Modelsward 2013
- Queen's Graduate Award, 7 semesters x \$1000 CDN; 2011 - 2014
- University of Waterloo Graduate Scholarship, Winter 2009
- Class Valedictorian, Thornhill Secondary School, 2002

Publications

Google Scholar Citations as of April 12, 2021		All
Citations		609
h-index		13
i10-index		17

Under Review

1. H.W. Alomari and M. Stephan, "Semantic Clone Detection through srcClone: A Program Slicing Based Approach", Journal of Systems and Software, **(Core Rank: A)**
2. B. Adhikari, E.J. Rapos, and M. Stephan, "SimIMA: A Virtual Simulink Intelligent Modeling Assistant", Software and Systems Modeling (SoSyM), **(Core Rank: B)**
3. M. Stephan, "Increasing Efficiency and Effectiveness of Learning for CS & SE Students Through Multiple Monitors", IEEE Transactions on Education, **(Core/ERA Rank: B; Impact factor 1.88)**

Peer-Reviewed Proceedings

1. H.W. Alomari and M. Stephan, "srcClone: Detecting Code Clones via Decompositional Slicing", International Conference on Program Comprehension, pages 274–284, July 2020. **(Qualis Rank: A2; 38.1% acceptance rate)**
2. M. Stephan, "Towards a Cognizant Virtual Software Modeling Assistant using Model Clones", International Conference on Software Engineering (ICSE) NIER Track, pages 21-24, May 2019. **(Core Rank: A*; 31% track acceptance rate)**
3. K. Koseler, K. McGraw, and M. Stephan, "Realization of a Machine Learning Domain Specific Modeling Language: A Baseball Analytics Case Study", International Conference on Model-Driven Engineering and Software Development (Modelsward), pages 15–26, February 2019. **(Qualis Rank: B2, 19.7% full paper acceptance rate)**
4. O. Babur and M. Stephan, "MoCoP: Towards a Model Clone Portal", International Workshop on Modeling in Software Engineering (MISE), pages 78-81, May 2019. **(Core Rank: C; ~50% acceptance rate)**
5. D. Black, E.J. Rapos, M. Stephan, "Voice-Driven Modeling: Software Modeling Using Automated Speech Recognition", Third Workshop on Model-Driven Engineering Tools, pages 252-258, 2019.

6. E.J. Rapos and M. Stephan, "IML: Towards an Instructional Modeling Language", International Conference on Model-Driven Engineering and Software Development (Modelsward), pages 419–427, February 2019. **(Qualis Rank: B2; 60% short paper acceptance rate)**
7. M. Stephan, "Emerging Concepts and Trends in Collaborative Modeling: A Survey", International Conference on Model-Driven Engineering and Software Development (Modelsward), pages 242–249, February 2019. **(Qualis Rank: B2; 60% short paper acceptance rate)**
8. H.W. Alomari and M. Stephan "Towards slice-based semantic clone detection", International Workshop on Software Clones (IWSC), pages 58-59, March 2018.
9. M. Stephan, "Challenges in Teaching Modeling in Agile Software Engineering Courses", International Conference on Model Driven Engineering Languages and Systems - Educators Symposium at MoDELS, Austin, Texas, USA, pages 525-528, September 2017.
10. K. Koseler and M. Stephan, "Towards the Realization of a DSML for Machine Learning: A Baseball Analytics Use Case", International Summer School on Domain-Specific Modeling Theory and Practice, Montreal, Canada, 6 pp., July 2017.
11. H. Alomari, R.A. Jennings, P. Virote de Souza, M. Stephan, and G. Gannod, "vizSlice: Efficient and Scalable Slicing Visualization for Impact Analysis", Working Conference on Software Visualization, North Carolina, USA, pages 101-105, October 2016. **(Core Rank: B)**
12. M. Stephan and J.R. Cordy, "Model-Driven Evaluation of Software Architecture Quality Using Model Clone Detection" International Conference on Software Quality, Reliability, and Security, Austria, pages 92-99, August 2016. **(Core Rank: B; 29% acceptance rate)**
13. G. Luitel, M. Stephan, D. Inclezan "Model Level Design Pattern Instance Detection using Answer Set Programming", International Conference of Software Engineering (ICSE) - Models in Software Engineering (MISE), pages 13-19, May 2016. **(Core Rank: C; ~50% acceptance rate)**
14. M. Stephan, and J.R. Cordy "Identification of Simulink Model Antipattern Instances using Model Clone Detection", International Conference on Model Driven Engineering Languages and Systems (MODELS), pages 276–285, September 2015. **(Core Rank: A; 26% acceptance rate)**
15. M. Stephan, and J.R. Cordy "Identifying Instances of Model Design Patterns and Antipatterns Using Model Clone Detection", International Conference of Software Engineering (ICSE) - Models in Software Engineering (MISE), pages 48–53, May 2015. **(Core Rank: C; ~50% acceptance rate)**
16. M. Stephan, "Model Clone Detector Evaluation Using Mutation Analysis", International Conference of Software Maintenance and Evolution 2014 (ICSME), pages 633 – 638, Sept 2014. **(Core Rank: A)**
17. M.H. Alalfi, E.J. Rapos, A. Stevenson, M. Stephan, T.R. Dean and J.R. Cordy, "Semi-automatic Identification and Representation of Subsystem Variability in Simulink Models", Proc. ICSME 2014, 30th International Conference on Software Maintenance and Evolution, Victoria, BC, pages 486 – 490, Sept 2014. **(Core Rank: A; 36% acceptance rate)**
18. M. Stephan, M. Alalfi, J.R. Cordy, "Towards a Taxonomy for Simulink Model Mutations", International Conference on Software Testing, Verification, and Validation 2014 (ICST) - Mutation Workshop, pages 206-215, March 2014. **(56% acceptance rate)**
19. M. Stephan, M. H. Alalfi, A. Stevenson, J. R. Cordy, "Evolution of Model Clones in Simulink", Models 2013 - Models and Evolution, pages 38-47, Sept 2013. **(Best Paper Award)**
20. M. Stephan, M.H. Alalfi, 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, pages 1261-1264, May 2013. **(Core Rank: A*; 22% acceptance rate)**
21. M. Stephan and J.R. Cordy, "A Survey of Model Comparison Approaches and Applications", International Conference on Model-Driven Engineering and Software Development, Barcelona, Spain, pages 265-277, February 2013.
(Best Student Paper Award; Qualis Rank: B2; 11% full paper acceptance rate)

22. M. Stephan and J.R. Cordy, "Application of Model Comparison Techniques to Model Transformation Testing", Proc. Modelsward 2013, International Conference on Model-Driven Engineering and Software Development, Barcelona, Spain, pages 307-311, February 2013.
(Qualis Rank: B2; 45% Short Paper acceptance rate)
23. M.H. Alalfi, J.R. Cordy, T.R. Dean, M. Stephan and A. Stevenson, "Models are Code Too: Near-miss Clone Detection for Simulink Models", International Conference on Software Maintenance, Riva del Garda, Italy, pages 295-304, September 2012. **(Core Rank: A; 25% acceptance rate)**
24. M. Stephan, M.N. Alalfi, A. Stevenson and J.R. Cordy, "Towards Qualitative Comparison of Simulink Model Clone Detection Approaches", International Workshop on Software Clones, Zurich, Switzerland, pages 84-85, June 2012.
25. M.H. Alalfi, J.R. Cordy, T.R. Dean, M. Stephan and A. Stevenson, "Near-miss Model Clone Detection for Simulink Models", International Workshop on Software Clones, Zurich, Switzerland, pages 78-79, June 2012.

Journal Articles

1. M. Stephan and J.R. Cordy, "MuMonDE: A Framework for Evaluating Model Clone Detectors using Model Mutation Analysis", Software Testing, Verification and Reliability Journal (STVR) Special Issue on Mutation Testing and Analysis, 29(1-2), 2019, e1669.
(Core Rank: B; ISI Rank: 41/104 in Computer Science, Software Engineering; Impact Factor: 1.556)
2. K. Koseler and M. Stephan, "Machine Learning Applications in Baseball: A Systematic Literature Review", Journal of Applied Artificial Intelligence, 31(9-10): 745-763. 2017.
(Core Rank: B; Impact Factor: 0.652)
3. M. Antkiewicz, K. Czarnecki, and M. Stephan, "Engineering of framework-specific modeling languages", Transactions of Software Engineering, Special Issue on Language Engineering, November 2009, pp. 795-824. **(Core Rank: A*; Impact Factor 3.272)**

Book and Book Chapters

1. M. Stephan and E.J. Rapos, Model Management and Analytics for Large Scale Systems - Model Clone Detection and its role in Emergent Model Pattern Mining, Pages 37-65. Elsevier, 2020.
2. M.H. Alalfi, E. J. Rapos, A. Stevenson, M. Stephan, T.R. Dean, J. R. Cordy, Automotive Systems and Software Engineering: State of the Art and Future Trends - Variability Identification and Representation for Automotive Simulink Models, Pages 109-139, Springer, 2019.

Other Publications

1. K. Koseler and M. Stephan, "A Survey of Machine Learning Techniques in Baseball", Department of Computer Science and Software Engineering, Miami University, Tech Rep# MU-CEC-CSE-2018-001, 2018, 31 pages. <https://sc.lib.miamioh.edu/handle/2374.MIA/6218>
2. Matthew Stephan, "A Mutation Analysis Based Model Clone Detector Evaluation Framework", Ph.D. thesis, Queen's University, 2014., <http://qspace.library.queensu.ca/handle/1974/12376>
3. 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. <http://research.cs.queensu.ca/TechReports/Reports/2011-582.pdf>
4. Matthew Stephan, "Detection of Java EE EJB Antipattern Instances using Framework-Specific Models", Master's thesis, University of Waterloo, 2009., <http://hdl.handle.net/10012/4362>
5. Matthew Stephan and M. Antkiewicz, "Ecore.fmp: A tool for editing and instantiating class models as feature models", ECE, University of Waterloo, Tech. Rep. #2008-08, 2008, <http://gsd.uwaterloo.ca/sites/default/files/2008-stephan-ecore-fmp.pdf>

Recent Teaching Experience

Assistant Professor, Miami University

Course: Introduction to Software Engineering (2 Sections) Average Overall Evaluation: 3.65/4 & 3.57/4 (Department mean: 3.10/4)	Spring 2020
Course: Software Engineering for UI/UX (2 Sections) Average Overall Evaluation: 3.52/4 & 3.50/4 (Department Mean (3.07/4)	Fall 2019
Course: Introduction to Software Engineering (2 Sections) Average Overall Evaluation: 3.55/4 & 3.52/4 (Department mean: 2.95/4)	Spring 2019
Course: Software Quality Assurance and Testing Average Overall Evaluation: 3.57 & 3.37/4 (Department Mean: 2.91/4)	Spring 2018
Course: Introduction to Software Engineering (2 Sections) Average Overall Evaluation: 3.57/4 (Department mean: 2.91/4)	Fall 2017
Course: Software Quality Assurance and Testing Average Overall Evaluation: 3.5/4 (Department Mean: 2.96/4)	Spring 2017
Course: Object-Oriented Programming (4 sections) Average Overall Evaluation: 3.47/4 (Department Mean: 2.96/4)	Spring 2017
Course: Object-Oriented Programming (2 sections) Average Overall Evaluation: 3.85 & 3.57/4 (Department Mean: 2.93/4)	Fall 2016
Course: Object-Oriented Programming (2 sections) Average Overall Evaluation: 3.64 & 3.59/4 (Department Mean: 2.94/4)	Spring 2016
Course: Introduction to Software Engineering (2 Sections) Average Overall Evaluation: 3.5/4 (Department mean: 2.9/4)	Fall 2015

Service and Memberships

ACM Professional Member

ACM Special Interest Group on Software Engineering Member

Miami University – University Senate

Chair of College of Engineering and Computing Faculty Advisory Committee

Chair or Committee

- Program Committee - International Conference on Software Engineering 2021, 2022 - Artifact Evaluation track
- Program Committee - International Conference on Model Driven Engineering Languages and Systems (MODELS) 2021 - Workshop Committee
- Organizing Committee – Artifact Evaluation Chair - International Conference on Model Driven Engineering Languages and Systems (MODELS) 2020
- Program Committee – International Workshop on Software Clones 2020
- Organizing Committee - Publicity Chair - International Conference on Model Driven Engineering Languages and Systems (MODELS) 2019
- Program Committee - International Workshop on Software Clones 2019
- Program Committee - International Workshop on Analytics and Mining of Model Repositories 2018
- Program Chair - International Workshop on Software Clones 2018
- Program Committee - International Conference on Program Comprehension @ ICSE 2018
- Program Committee - International Conference on Conceptual Modeling (ER) 2018
- Program Committee - Model-Driven Engineering Tools Challenge @ MODELS 2017-2018
- Program Committee - MODELS Student Research Contest 2016-2019
- Session Chair - International Workshop on Information Assurance @ QRS 2016
- Program Committee - Open Source Software for Model-Driven Engineering @ MODELS 2016
- Session Chair - Modelling in Software Engineering @ ICSE 2015

Reviewer

- Journal of Software: Evolution and Process 2021
- Journal of Software and Systems Modeling 2014-2018, 2020, 2021
- IEEE Transactions on Education 2019, 2021
- Journal of Systems and Software 2020
- Artificial Intelligence Review (AIRE) 2019
- Empirical Software Engineering 2012, 2019
- Journal of Visual Languages and Computing 2018
- IEEE Software 2018
- IET Software Journal 2016
- Journal of Software: Evolution and Process 2015
- International Conference on Software Maintenance and Evolution 2015
- Science of Computer Programming Journal 2013
- Software Language Engineering 2013
- International Conference on Software Maintenance 2010, 2012
- International Conference on Model Transformation 2011
- International Working Conference on Source Code Analysis and Manipulation 2011
- CASCON Annual International Conference on Computer Science and Software Engineering 2011
- Software Maintenance and Reengineering 2010
- International Conference on Program Comprehension 2010
- International Working Conference on Source Code Analysis and Manipulation 2010

Mentoring Experience

Graduate Supervisor

- Bhisma Adhikari, Master's, Topic on Cognizant Virtual Software Modeling Assistance, In Progress
- Dana Black, Master's, Topic on Voice-Driven Software Modeling, In Progress
- Kaan Koseler, Master's, "Realization of Model Driven Engineering for Big Data: A Model-Driven Framework for Machine Learning Baseball Analytics", Graduated - Spring 2018
- Gaurab Luitel, Master's, "Model Level Design Pattern Instance Detection Using Answer Set Programming", Graduated - Summer 2016

Advisor

Academic Advisor, Miami University

2016 – Present

Advise upwards of over 70 students a semester to help them plan out their academic and professional careers. Help with course sequencing, inter-personal conflicts, career development, and more.

Faculty/Chapter Advisor, Alpha Epsilon Pi

2009 – Present

Continually guide and mentor the chapter's executive board on how to plan, organize, and develop successful philanthropic, networking, and other ventures. Often organize and give lectures to chapters of 30-60 members on general chapter operations and specific advice.

Faculty Advisor, Chabad Miami University

2014 – Present

Provide continual leadership, feedback, and guidance to this organization on growth activities, student engagement, and event ideas.

Head Staff, Camp Winnebago

Summers 2007-2015

Responsible for upwards of 16 staff and 90 campers belonging to my assigned unit. Mentor and teach staff to become better counselors. Perform formal evaluations twice a summer. Frequently speak in front of 300+ campers and staff.

Industrial Experience

Systems Analyst Co-op, Deloitte Inc., Toronto, Canada	2006
Software Engineering Co-op, Visa International, San Jose, California	2005
Software Developer Co-op, CheckFree Corporation, Waterloo, Canada	2003, 2004
JR PC/Client Server Developer, Canadian Imperial Bank of Commerce, Toronto, Canada	2004

Citizenship, Residency

Canadian Citizen, United States Permanent Resident

References

Available Upon Request