

## Mario J. Badr

---

CONTACT INFORMATION	The Edward S. Rogers Department of Electrical and Computer Engineering Room 1107, Sandford Fleming Bldg. 10 King's College Road, Toronto, ON M5S 3G4 Canada University of Toronto	
RESEARCH INTERESTS	Many-core/multi-core/heterogeneous architectures, synchronization, cache coherence, interconnection networks, analytical models, computer systems performance analysis.	
EDUCATION	<b>Ph.D., Computer Engineering</b>	September, 2013 - Present
	<i>University of Toronto</i>	<i>Toronto, Ontario, Canada</i>
	Dissertation: "Novel Evaluation Methodologies for Future Architectures" Advisor: Natalie Enright Jerger	
	<b>M.A.Sc, Computer Engineering</b>	January 2014
	<i>University of Toronto</i>	<i>Toronto, Ontario, Canada</i>
	Thesis: "Synthetic Traffic Models that Capture Cache Coherence Behaviour" Advisor: Natalie Enright Jerger	
	<b>B.A.Sc, Electrical Engineering</b>	May 2011
	<i>University of Toronto</i>	<i>Toronto, Ontario, Canada</i>
INDUSTRY EXPERIENCE	<b>Qualcomm Research Silicon Valley</b>	Santa Clara, California, USA
	<i>Intern (C++, OpenCL, Hexagon, CMake)</i>	<i>May, 2015 - August, 2015</i>
	Used the Multicore Asynchronous Runtime Environment (MARE) to develop a heterogeneous application with multiple domain-specific kernels. Provided feedback to the MARE team on performance issues and bottlenecks.	
	<b>Environment Canada</b>	Toronto, Ontario, Canada
	<i>Intern (Java, XML)</i>	<i>June, 2009 - August, 2010</i>
	Implemented new features and bug fixes for the NinJo workstation, a tool for meteorologists. Notable projects include upgrading the visualization framework for lightning strikes to be faster and use significantly less memory, incorporating storm cell data for Canada, and helping to create a configurable view of weather data for a given storm cell.	
AWARDS & SCHOLARSHIPS	<b>Ontario Graduate Scholarship - \$15,000</b>	2017
	Awarded for excellence in graduate studies.	
	<b>Electrical &amp; Computer Engineering Teaching Assistant Award</b>	2016
	Awarded by student vote and department review to the top three teaching assistants for the Fall semester.	
	<b>Roberto Padovani Intern Scholarship - \$5,000</b>	2015
	Awarded to seven Qualcomm Research interns across the globe for outstanding technical contributions made during their internship.	
	<b>Thomas Noakes &amp; Queen Elizabeth II Graduate Scholarship - \$15,000</b>	2015
	Awarded for excellence in science and technology.	
	<b>Teaching Assistant Teaching Excellence Award - \$200</b>	2015
	Awarded to four recipients across the three University of Toronto campuses based on nominations, references, and teaching philosophy.	

PEER-REVIEWED PUBLICATIONS	Joshua San Miguel, Karthik Ganesan, <b>Mario Badr</b> , and Natalie Enright Jerger. <i>The EH Model: Analytical Exploration of Energy-Harvesting Architectures</i> . In IEEE Computer Architecture Letters, November 2017.	
	Joshua San Miguel, <b>Mario Badr</b> , and Natalie Enright Jerger. <i>Load Value Approximation</i> . In Proceedings of the International Symposium on Microarchitecture (MICRO), December 2014. (acceptance rate: 19%)	
	<b>Mario Badr</b> and Natalie Enright Jerger. <i>SynFull: Synthetic Traffic Models Capturing a Full Range of Cache Coherence Behaviour</i> . In Proceedings of the International Symposium on Computer Architecture (ISCA), June 2014. (acceptance rate: 18%)	
REFEREED WORKSHOPS & POSTERS	<b>Workshop Paper</b>	
	Tushar Kumar, Aravind Natarajan, Wenjia Ruan, <b>Mario Badr</b> , Dario Suarez Gracia, Calin Cascaval <i>Abstract Representation of Shared Data for Heterogeneous</i> . In the 30th International Workshop on Languages and Compilers for Parallel Computing (LCPC), October 2017.	
	<b>Workshop Paper</b>	
PRESENTATIONS	Ajaykumar Kannan, <b>Mario Badr</b> , Parisa Khadem Hamedani and Natalie Enright Jerger. <i>Of-flooding to the GPU: An Objective Approach</i> . In Proceedings of the International Workshop on Parallelism in Mobile Platforms (PRISM), June 2015.	
	<b>Poster</b>	
	Joshua San Miguel, <b>Mario Badr</b> , and Natalie Enright Jerger. <i>Load Value Approximation</i> . At the International Symposium on Microarchitecture (MICRO), December 2014.	
	<b>Mario Badr</b> , Natalie Enright Jerger, Riken Gohil, Radhika Jagtap, and Matteo Andreozzi. <i>Generating Synthetic Traffic for Heterogeneous Architectures</i> At the ARM Research Summit, September 2017.	
	<b>Mario Badr</b> and Natalie Enright Jerger. <i>SynFull: Traffic Models Capturing Cache Coherence Behaviour</i> . At the International Symposium on Computer Architecture (ISCA), June 2014.	
SOFTWARE ARTIFACTS	<b>Mario Badr</b> and Natalie Enright Jerger. <i>SynFull: Synthetic Traffic Models That Capture Cache Coherent Behaviour</i> . At the University of Toronto Electrical and Computer Engineering Graduate Symposium (Connections), May 2014. Awarded <i>Best Oral Presentation</i> .	
	<b>Mario Badr</b> and Natalie Enright Jerger. <i>Realistic Synthetic Traffic</i> At the University of Toronto Electrical and Computer Engineering Graduate Symposium (Connections), May 2012.	
	<b>SynFull</b>	MIT License
TEACHING EXPERIENCE	Implementation of a statistical simulation methodology for design-space exploration of Networks-on-Chip. The artifact includes R scripts for generating models based on network traces. In addition, a C++ executable can load the models to generate synthetic traffic.	
	<b>Engineering Strategies and Practice</b>	1st Year Undergraduates, T-Program
	<i>Teaching Assistant</i>	<i>Tutorials</i>
	Supervised students through the design process for a given project and provided feedback on written design documents, with a focus on stimulating an engineering methodology to design.	
	<b>Computer Fundamentals</b>	1st Year Undergraduates, T-Program
	<i>Teaching Assistant</i>	<i>Tutorials, Computer Lab</i>
	Taught the fundamentals of computer programming in C, including data structures, recursion, and sorting algorithms. Also delivered the 2013 Exam Jam review session, covering multiple prior exam questions in detail.	

	<b>Programming Fundamentals</b> <i>Teaching Assistant, Substitute Lecturer</i> Taught the fundamentals of C++ and object-oriented programming, including value versus reference semantics and memory management on the stack and heap. Delivered two lectures on recursion using an in-depth maze example with a step-by-step visualization of the maze traversal.	2nd Year Undergraduates <i>Tutorials</i>
	<b>Communication and Design</b> <i>Teaching Assistant, Course Development</i> Mentored student groups in the implementation of an application that visualizes and finds routes in a city map. Developed six new tutorials in 2017 to help students with software engineering.	2nd Year Undergraduates <i>Tutorials, Computer Lab</i>
	<b>Computer Organization</b> <i>Teaching Assistant</i> Supervised and helped students implement a simple von Neumann processor using verilog.	3rd Year Undergraduates <i>Computer Lab</i>
	<b>Computer Architecture</b> <i>Teaching Assistant</i> Taught computer architecture concepts, including caches, pipelining, out-of-order cores, and cache coherence.	4th Year Undergraduates & Graduates <i>Computer Lab</i>
	<b>Appointed Graduate Representative</b> Executive Committee of Faculty Council - Faculty of Applied Science & Engineering	2015-2016
UNIVERSITY SERVICE	<b>Graduate Representative</b> Faculty Council - Faculty of Applied Science & Engineering	2015-2016
	<b>President</b> Electrical and Computer Engineering Graduate Students' Society	2015-2016
	<b>Department Steward</b> Canadian Union of Public Employees	2013-2014
	<b>Social Event Coordinator</b> Electrical and Computer Engineering Graduate Students' Society	2012-2013
	<b>Teaching in Higher Education</b> One semester course Learned more about teaching theories and styles and was observed by peers while teaching a tutorial on Computer Architecture. Developed a course syllabus for a fictitious course.	2015
PROFESSIONAL DEVELOPMENT	<b>Teaching Engineering in Higher Education</b> <i>One semester course</i> Learned concepts on curriculum, teaching, and learning. Reviewed research in engineering education.	2015
	<b>Prospective Professors in Training</b> <i>Thirteen Seminars, One semester course</i> Began preparations for becoming a professor in academia and prepared academic dossier.	2014-2015
	<b>Mini-MBA</b> <i>Ten Classes</i> Gained an understanding of fundamental business concepts and participated a case competition.	2015
	<b>Oral Presentation Skills</b> <i>Five Classes</i> Examined presentation structure and the use of visual aids. Exchanged feedback with peers.	2014

- Prewriting Strategies for Developing and Organizing Your Ideas** 2014  
*Four Classes*  
Learned several new strategies for developing and organizing ideas before the writing process.
- NSERC Proposal Workshop** 2014  
*Three Classes*  
Examined features of good and bad proposal writing, and exchanged feedback with peers.
- Teaching Fundamentals Certificate** 2012-2013  
*Six Workshops*  
Improved my teaching skills with workshops on pedagogy, research, academic integrity, and students in difficulty.