

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	Ph.D., Computer Engineering	September, 2013 - Present	
	<i>University of Toronto</i>	<i>Toronto, Ontario, Canada</i>	
	Dissertation: "Novel Evaluation Methodologies for Future Architectures" Advisor: Natalie Enright Jerger		
	M.A.Sc, Computer Engineering	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.A.Sc, Electrical Engineering	May 2011	
	<i>University of Toronto</i>	<i>Toronto, Ontario, Canada</i>	
INDUSTRY EXPERIENCE	Qualcomm Research Silicon Valley	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.		
	Environment Canada	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	Ontario Graduate Scholarship - \$15,000	2017	
	Awarded for excellence in graduate studies.		
	Electrical & Computer Engineering Teaching Assistant Award	2016	
	Awarded by student vote and department review to the top three teaching assistants for the Fall semester.		
	Roberto Padovani Intern Scholarship - \$5,000	2015	
	Awarded to seven Qualcomm Research interns across the globe for outstanding technical contributions made during their internship.		
	Thomas Noakes & Queen Elizabeth II Graduate Scholarship - \$15,000	2015	
	Awarded for excellence in science and technology.		

	<p>Teaching Assistant Teaching Excellence Award - \$200 2015</p> <p>Awarded to four recipients across the three University of Toronto campuses based on nominations, references, and teaching philosophy.</p>
PEER-REVIEWED PUBLICATIONS	<p>Joshua San Miguel, Karthik Ganesan, Mario Badr, and Natalie Enright Jerger. <i>The EH Model: Analytical Exploration of Energy-Harvesting Architectures</i>. In IEEE Computer Architecture Letters, November 2017.</p> <p>Joshua San Miguel, Mario Badr, and Natalie Enright Jerger. <i>Load Value Approximation</i>. In Proceedings of the International Symposium on Microarchitecture (MICRO), December 2014. (acceptance rate: 19%)</p> <p>Mario Badr 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%)</p>
REFEREED PAPERS	<p>Mario Badr and Natalie Enright Jerger. <i>Fast and Accurate Performance Analysis of Synchronization</i>. In Proceedings of the 9th International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM), February 2018.</p> <p>Tushar Kumar, Aravind Natarajan, Wenjia Ruan, Mario Badr, Dario Suarez Gracia, Calin Cascaval. <i>Abstract Representation of Shared Data for Heterogeneous Computing</i>. In the 30th International Workshop on Languages and Compilers for Parallel Computing (LCPC), October 2017.</p> <p>Ajaykumar Kannan, Mario Badr, Parisa Khadem Hamedani and Natalie Enright Jerger. <i>Offloading to the GPU: An Objective Approach</i>. In the 3rd International Workshop on Parallelism in Mobile Platforms (PRISM), June 2015.</p>
PRESENTATIONS	<p>Mario Badr, 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.</p> <p>Mario Badr and Natalie Enright Jerger. <i>SynFull: Traffic Models Capturing Cache Coherence Behaviour</i>. At the International Symposium on Computer Architecture (ISCA), June 2014.</p> <p>Mario Badr 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>.</p> <p>Mario Badr and Natalie Enright Jerger. <i>Realistic Synthetic Traffic</i> At the University of Toronto Electrical and Computer Engineering Graduate Symposium (Connections), May 2012.</p>
SOFTWARE ARTIFACTS	<p>SynFull <i>MIT License</i></p> <p>Implementation of a statistical simulation methodology for design-space exploration of Networks-on-Chip. Includes R scripts for creating models and an executable to generate synthetic traffic.</p>
TEACHING EXPERIENCE	<p>Engineering Strategies and Practice 1st Year Undergraduates, T-Program</p> <p><i>Teaching Assistant</i> <i>Tutorials</i></p> <p>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.</p>

	Computer Fundamentals <i>Teaching Assistant</i> Taught the fundamentals of computer programming in C, including data structures, recursion, and sorting algorithms. Also delivered the 2013 Exam Jam review session.	1st Year Undergraduates, T-Program <i>Tutorials, Computer Lab</i>
	Programming Fundamentals <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>
	Communication and Design <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>
	Computer Organization <i>Teaching Assistant</i> Supervised and helped students implement a simple von Neumann processor using verilog.	3rd Year Undergraduates <i>Computer Lab</i>
UNIVERSITY SERVICE	Computer Architecture <i>Teaching Assistant</i> Taught computer architecture concepts (e.g., caches, pipelining, out-of-order cores, multicore).	4th Year Undergraduates & Graduates <i>Computer Lab</i>
	Appointed Graduate Representative Executive Committee of Faculty Council - Faculty of Applied Science & Engineering	2015-2016
	Graduate Representative Faculty Council - Faculty of Applied Science & Engineering	2015-2016
	President Electrical and Computer Engineering Graduate Students' Society	2015-2016
	Department Steward Canadian Union of Public Employees	2013-2014
	Social Event Coordinator Electrical and Computer Engineering Graduate Students' Society	2012-2013
PROFESSIONAL DEVELOPMENT	Teaching in Higher Education 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
	Teaching Engineering in Higher Education <i>One semester course</i> Studied concepts and research on curriculum, teaching, and learning in engineering education.	2015
	Prospective Professors in Training <i>Thirteen Seminars, One semester course</i> Began preparations for becoming a professor in academia and prepared an academic dossier.	2014-2015

Mini-MBA <i>Ten Classes</i> Gained an understanding of fundamental business concepts and participated a case competition.	2015
Oral Presentation Skills <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 <i>Four Classes</i> Learned several new strategies for developing and organizing ideas before the writing process.	2014
NSERC Proposal Workshop <i>Three Classes</i> Examined features of good and bad proposal writing, and exchanged feedback with peers.	2014
Teaching Fundamentals Certificate <i>Six Workshops</i> Improved my teaching skills with workshops on pedagogy, research, academic integrity, and students in difficulty.	2012-2013