

Charles Eric LaForest

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Education:

Candidate for Doctor of Philosophy, ECE
Supervisor: Greg Steffan
University of Toronto
September 2009 - Present

Master of Applied Science, ECE
Efficient Multi-Ported Memories for FPGAs
Supervisor: Greg Steffan
University of Toronto
September 2009

Bachelor of Independent Studies
Second-generation Stack Computer Architecture
Supervisors: Greg Steffan (UT) & Andrew Morton (UW)
University of Waterloo
April 2007

Computer Engineering Technology Diploma
Cooperative Education Program
Algonquin College (Ottawa)
December 1998

Publications:

Charles Eric LaForest and J. Gregory Steffan, *Efficient Multi-Ported Memories for FPGAs*, ACM International Symposium on Field-Programmable Gate Arrays (FPGA), February 2010, Monterey, CA.

Charles Eric LaForest, Ming G. Liu, Emma Rae Rapati, and J. Gregory Steffan, *Multi-Ported Memories for FPGAs via XOR*, ACM International Symposium on Field-Programmable Gate Arrays (FPGA), February 2012, Monterey, CA.

Charles Eric LaForest and J. Gregory Steffan, *Octavo: An FPGA-Centric Processor Family*, ACM International Symposium on Field-Programmable Gate Arrays (FPGA), February 2012, Monterey, CA.

Awards:

- 2010 Right Track CAD Graduate Scholarship (\$1,500)
- 2011 Queen Elizabeth II Graduate Scholarship in Science and Technology (\$15,000)

Work Experience:

Teaching Assistant		University of Toronto
ECE 1755	Parallel Computer Architecture	Fall 2008
ECE 540	Optimizing Compilers	Spring 2009 and 2012
ECE 385	Microprocessor Systems	Fall 2010
APS 111	Engineering Strategies and Practice I	Fall 2009 and 2010
APS 112	Engineering Strategies and Practice II	Spring 2010 and 2011
ECE 243	Computer Organization	Spring 2011 (Head TA)
CSC 372	Microprocessor Software	Fall 2011

Software Developer, Co-Op terms

Analyzed performance of cross-core interface on multi-core device. Wrote new GSM regression test framework . Debugged modem software. Debugged regression testing of interrupt routines. Created GSM test cases.

Research In Motion
Waterloo, ON
May 2007 – August 2007
May 2006 – August 2006

Research Assistant, Worked with two Professors at the University of Waterloo on the detection of rhetorical choices (stylistic variations) in C source code. Explored approaches based on statistical language modelling experiments.

University Of Waterloo
Waterloo, ON
May 2005 - August 2005

Shipping, Receiving, and Shop Clerk, Worked in the company shop, managing the inventory, purchases, and sales of elevator parts. Supported the field mechanics, performed small mechanical repairs in-shop, designed and commissioned custom tools. Managed the company's used oil disposal and metal recycling.

Capital Elevator Ltd.
Ottawa, ON
February 2003 – Sept. 2004

Part-Time Teacher, Taught a one-term Passive Circuits course. Designed and conducted lectures, tests, and lab exercises covering Ohm's Law, complex numbers, exponentials, series and parallel DC and AC circuits, and RLC filters.

Algonquin College
Ottawa, ON
January 2003 - April 2003

Software Developer, Ported company product from PC to the Playstation 2. Implemented a credit card verification back-end for secure online membership purchases.

TransGaming Technologies
Ottawa, ON
November 2001 – Sept. 2002

Extra-Curricular Activities:

Junior Fellow

Participating in Science & Medicine Round Tables, Junior Fellow Lectures, and other College functions.

Massey College
University of Toronto
2009 – 2010

Organizer

Leading discussion on various computing topics.
Booking rooms and managing presentation schedule.

Compiler and Architecture
Reading Group
University of Toronto
2009 – Present

President

Re-organized Society finances. Updated constitution.
Represented the Society to the Federation of Students.

Society of Independent Students
University of Waterloo
2005 – 2006

Treasurer

Collected and deposited membership dues.
Managed club funds with Federation of Students.

Campus Crusade For Cheese
University of Waterloo
2005 – 2006

Writer

Researched and wrote “*Terrapin Station: An Alternative Approach To Space Exploration*”. Published in the November 2005 issue of the Canadian Space Gazette.

Waterloo Space Society
Waterloo, ON
2005

Radio Operator

Coordinated Amateur Radio communications for marathon checkpoints.

Canadian Ski Marathon
Gatineau, QC
2000 – 2003

Programming Languages:

- Assembly
 - 68000
 - 6502
 - ARM
 - MIPS
- Bash
- Basic
- C
- Forth
- Perl
- Python
- Verilog
- VHDL

Development Tools:

- CMU-Cambridge Statistical Language Modeling Toolkit
- Altera Quartus
- Modelsim
- Electric VLSI CAD
- Altera DE2 FPGA board

Past Designs and Projects:

- Stack-based CPU system:
 - UNIX-based system simulator
 - FPGA implementation on DE2
 - Forth-like programming language assembler and compiler
 - OS kernel supporting memory protection and virtualization
- Synthesis, testing, VLSI layout, and optimization of Burst-Mode asynchronous control circuits
- Python client-server system for batch task processing
- Python back-end for ECE 540 website: automated benchmarking and ranking of projects
- Python framework for FPGA Verilog code generation, synthesis, and analysis
- Python website traffic analyzer
- Correlation of solar activity with failure rates in large computer installations
- Message-passing parallel sort implementation using 6000+ threads

Courses:

- ECE 1747 – Parallel Programming
- ECE 1755 – Parallel Computer Architecture
- CSC 2227 – Topics in the Design and Implementation of Operating Systems
- ECE 1754 – Parallelizing Compilers
- ECE 540 – Optimizing Compilers
- ECE 1762 – Algorithms and Data Structures
- ECE 1636 – Supervisory Control of Discrete Event Systems
- CSC 2232 – Topics in Computer System Performance and Reliability
- ECE 1724 – Topics in Software Eng.: Programming Massively Parallel Graphics Processors
- JEB 1444 – Neural Engineering