

# Charles Eric LaForest, PhD

## Curriculum Vitae

Email: [eric.laforest@gmail.com](mailto:eric.laforest@gmail.com)

Web: <http://fpgacpu.ca>

Code: <https://github.com/laforest/FPGADesignElements>

### Education

- **PhD**, “High-Speed Soft-Processor Architecture for FPGA Overlays”, ECE, University of Toronto, 2009-2015  
Supervisor: Greg Steffan (until 2013; deceased 2014)  
Jason Anderson (2013 until completion)
- **MASc**, “Efficient Multi-Ported Memories for FPGAs”, ECE, University of Toronto, 2007-2009  
Supervisor: Greg Steffan
- **BIS**, “Second-Generation Stack Computer Architecture”, Independent Studies, University of Waterloo, 2004-2007  
Supervisor: Chrysanne DiMarco
- **Diploma**, Computer Engineering Technology, Algonquin College, Ottawa, 1995-1999

### Professional employment

- **Owner**, GateForge Consulting Ltd., Toronto, 2016-present
- **Principal Engineer**, Summit Scientific Inc., 2017-2021
- **Senior ASIC/Layout Design Engineer**, AMD, Markham, 2014-2016
- **Software development co-op**, Research In Motion, Waterloo, summers 2006-2007
- **Research assistant**, University of Waterloo, summer 2005  
Supervisor: Chrysanne DiMarco, Dept. of Computer Science
- **Shop clerk and technician**, Capital Elevator Ltd., Ottawa, 2003-2004
- **Electronics instructor**, Algonquin College, Ottawa, spring 2003
- **Software developer**, TransGaming Technologies, Ottawa, 2001-2002
- **Software developer**, Rebel.com, Ottawa, 2000-2001
- **Linux consultant**, OE/ONE, Ottawa, 1999
- **Engineering technologist**, Applied AI Systems, Kanata, 1999

## Journal articles

2017

- Charles Eric LaForest and Jason Anderson. Microarchitectural Comparison of the MXP and Octavo Soft-Processor FPGA Overlays. *ACM Transactions on Reconfigurable Technology and Systems (TRET)*, Volume 10, Issue 3, Article No. 19 (May 2017), 25 pages

2014

- Charles Eric LaForest, Zimo Li, Tristan O'Rourke, Ming G. Liu, and J. Gregory Steffan. Composing Multi-Ported Memories on FPGAs. *ACM Transactions on Reconfigurable Technology and Systems (TRET)*, Volume 7, Issue 3, Article 16 (September 2014), 23 pages.

## Conference proceedings

2014

- Charles Eric LaForest, Jason Anderson, and J. Gregory Steffan. Approaching Overhead-Free Execution on FPGA Soft-Processors. *Proceedings of the IEEE International Conference on Field-Programmable Technology (ICFPT) 2014*, pp. 99-106  
Acceptance rate: 29%

2013

- Charles Eric LaForest, J. Gregory Steffan. Maximizing Speed and Density of Tiled FPGA Overlays via Partitioning. *Proceedings of ICFPT 2013*, pp. 238-245  
Acceptance rate: 21%

2012

- Charles Eric LaForest, Ming G. Liu, Emma Rae Rapati, and J. Gregory Steffan. Multi-Ported Memories for FPGAs via XOR. *Proceedings of the ACM International Symposium on Field-Programmable Gate Arrays (FPGA) 2012*, pp. 209-218
- Charles Eric LaForest, J. Gregory Steffan. Octavo: An FPGA-Centric Processor Family. *Proceedings of FPGA 2012*, pp. 219-228, Acceptance rate: 23%

2010

- Charles Eric LaForest, J. Gregory Steffan. Efficient Multi-Ported Memories for FPGAs. *Proceedings of FPGA 2010*, pp. 41-50  
Acceptance rate: 25%

## Awards

2012

- *FPGA 2010* paper selected as one of the top 25 papers (top 5%) of the first 20 years of the conference. Reprinted in *FPGA20: Highlighting Significant Contributions from 20 Years of the International Symposium on Field-Programmable Gate Arrays (1992-2011)*.

## Scholarships

- 2014, ECE Doctoral Completion Award (\$23,880)
- 2013, Walter C. Sumner Fellowship (\$6,000)
- 2012, Walter C. Sumner Fellowship (\$6,000)
- 2011, QEII/ISS'97: World Telecommunication Congress Graduate Scholarship in Science and Technology (\$15,000)
- 2010, Right Track CAD Graduate Scholarship (\$1,500)

## Teaching (TA)

- ECE 540 - Optimizing Compilers (2009, 2012, 2013)
- APS 105 - Computer Fundamentals (2012, 2013)
- APS 112 - Engineering Strategies and Practice II (2010, 2011)
- ECE 243 - Computer Organization (2011, Head TA)
- CSC 372 - Microprocessor Software (2011)
- ECE 385 - Microprocessor Systems (2010)
- APS 111 - Engineering Strategies and Practice I (2009, 2010)
- ECE 1755 - Parallel Computer Architecture (2008)

## Service

- Reviewer
  - IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2016
  - ACM Transactions on Reconfigurable Technology and Systems, 2015-2016
  - Hindawi International Journal of Reconfigurable Computing, 2015
  - IET Circuits, Devices & Systems, 2019
- School outreach volunteer, ECE, University of Toronto, 2011-2013
- Manager, Compiler/Architecture Reading Group, University of Toronto, 2009-2012
- President, Society of Independent Students, University of Waterloo, 2005-2006
- Treasurer, Campus Crusade for Cheese Club, University of Waterloo, 2005-2006
- Amateur Radio Operator, Canadian Ski Marathon, 2000-2003