

# Charles Eric LaForest, PhD

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

<http://fpgacpu.ca>

<http://github.com/laforest/Octavo>

## Profile

Design consultant specialized in high-performance FPGA applications

## Skills

High-speed Verilog/VHDL logic design for FPGA devices

Software development in Python, C, Forth, and assembly (MIPS, ARM, 6502)

Linux user-space and kernel software development

## Education

**PhD**, "High-Speed Soft-Processor Architecture for FPGA Overlays", Univ. of Toronto, 2015

- Designed the Octavo high-speed soft-processor family (500 MHz, Stratix IV FPGA)
- Invented logic design techniques for early timing closure and parallel scaling
- Published 3 conference papers and 1 journal article on soft-processor design

**MASc**, "Efficient Multi-Ported Memories for FPGAs", University of Toronto, 2009

- Reprinted in 2012 in top 25 papers of first 20 years of ACM FPGA conference
- Published 2 conference papers and 1 journal article on multi-ported memory design
- Multiple follow-up research publications ( <http://fpgacpu.ca/multiport> )

**BIS**, "Second-Generation Stack Computer Architecture", University of Waterloo, 2007

**Diploma**, Computer Engineering Technology, Algonquin College, Ottawa, 1999

## Experience (Excerpts)

**Owner**, GateForge Consulting Ltd., Toronto, 2016-present

- Providing design services for FPGA applications

**Senior ASIC/Layout Design Engineer**, Advanced Micro Devices, Markham, 2014-2016

- Emulated AMD Secure Processor (PSP) on Xilinx Virtex 7 FPGA
- Led bring-up effort for post-silicon PSP diagnostic firmware
- Led analysis of Synplify FPGA technology-mapping issues

**Electronics Instructor**, Algonquin College, Ottawa, spring 2003

- Planned and taught a passive circuits course (theory, labs, and evaluations)

**Software Developer**, TransGaming Technologies, Ottawa, 2001-2002

- Improved exception handling in PlayStation 2 Linux kernel for WIN32 emulation

**Software Developer**, Rebel.com, Ottawa, 2000-2001

- Researched adaptive fixed-point calculations on ARM SA-110 CPU

**Linux Consultant**, OE/One, Ottawa, 1999

- Designed first product: a multimedia browser-based GUI with database back-end

**Software Developer**, Greylands/Zones Grises, Ottawa, 1999

- Designed a Wi-Fi tunnel for RS-232 links used by mobile GPS units
- Implemented conversions between floating-point number formats

**Engineering Technologist**, Applied AI Systems, Kanata, 1999

- Ported PID motor controller from Motorola 68000 platform to x86 Real-Time Linux