Charles Eric LaForest, PhD

eric.laforest@gmail.com   https://github.com/laforest/FPGADesignElements
http://fpgacpu.ca/

Profile

Design consultant specialized in high-performance and embedded FPGA applications and related software

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

Principal Engineer, Summit Scientific Inc., 2017-2021
- Designing FPGA solutions for industrial, scientific, and medical 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