

Mark Lipski
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<https://github.com/MarkLipski/Working-Projects>

Summary

I am a motivated and energetic graduate who is passionate about microelectronics and circuit design. I have experience with analog design, power electronics, radio frequency design, controls, and programming. I have performed novel research on fully integrated power electronics, coming up with new ways to model and modify existing architectures. My ideal job would allow me to utilize my diverse skillset and solve problems in a team environment.

Skills

Areas of Expertise: Power Electronics - DC/DC conversion, High Frequency Circuits - (VCO, LNA and PA design, inductor and varactor design, high speed transistor layout), Analog Circuits, Digital Circuits, Optics, Linear Control, Microcontroller and FPGA Programming

Software: Cadence, Schematic Capture, Calibre, Virtuoso, Simulink, LabView, Windows, Linux, Excel, Latex

Programming Languages: C, VHDL, Java, Python, Matlab, C++, ARM Assembly.

Soft Skills: Excellent at working in groups and presenting, highly outgoing, good written skills, excellent problem solving and analysis, creative.

Education

MASc in Computer Engineering | University of Guelph

Guelph, Ontario

May 2018 - Sept. 2019

- Research focusing on novel switched capacitor power conversion techniques to further improve the efficiency, and performance of fully integrated DC/DC converters and increase their range of possible applications.
- Cumulative average of 94% in four graduate courses on computer engineering, including 95% in high speed circuits at the University of Toronto.
- Coursework involved designing several RF circuits using Cadence for frequencies $< 20\text{GHz}$, including a PA, LNA, VCO, and the layout and optimization of the inductors, transistors and varactors used in the associated designs.
- Involved in the design of numerous analog building blocks in Cadence for use in a delta-sigma modulator, including bandgaps, op-amps, and dynamic comparators.
- Programmed a 1.5D-FDTD electromagnetic solver in python from first principles in order to simulate the interaction between circuit dynamics and optical systems.

B.Eng in Systems and Computing | University of Guelph

Guelph, Ontario

Sept. 2013 - April 2018

- Broad exposure to engineering topics, electronics, communication and embedded systems, design projects.
- Involved in the microcontroller selection and programming, and the design of the motor interface, for a Capstone project to create a haptic feedback system for diabetes patients with nerve damage.
- Created the architecture and instruction set from the ground up for the implementation of a 5-stage pipelined MIPS processor in VHDL and tested it using an FPGA.
- Designed a digital control system in simulink for an unstable non-linear magnetic levitation design project.

Experience

Research Assistant | University of Guelph
April 2016 – September 2019

Guelph, Ontario

- Author of four and co-author of three peer-reviewed papers focusing on the topics of modelling, optimization and design techniques for fully integrated power electronics.
- Developed and implemented a control system for use in a fully integrated power converter in 65nm CMOS technology using both analog and digital techniques.
- Performed transistor layout and optimization of power switches for implementation in a DC/DC converter using Cadence tools.
- Designed a low threshold active diode in order to improve the performance and functional voltage range of electro-mechanical energy harvesters using analog design techniques.

Teaching Assistant | University of Guelph
September 2017 - December 2018

Guelph, Ontario

- Teaching assistant for a third year electronics course of 170 students, covering topics on device physics, as well as circuit and amplifier analysis.
- Developed course material for use in a laboratory setting by revising and expanding upon the existing lab manual.
- Developed and delivered teaching materials and problem sets for use in biweekly tutorial sessions.
- Lead teaching assistant team by managing and overseeing lab sessions to provide auxiliary support for students.

Relevant Publications

- **Switched-capacitor power converters with soft charging via auxiliary capacitor bank**, *Mark Lipski, Stefano Gregori*, IEEE Midwest Symposium on Circuits and Systems (MWSCAS), 2019
- **Analysis of charge reuse in switched-capacitor power-converter drivers**, *Mark Lipski, Stefano Gregori*, IEEE Midwest Symposium on Circuits and Systems (MWSCAS), 2019
- **A low forward bias active diode circuit for electrostatic energy harvesters**, *Mark Lipski, Yin Li, Manjusri Misra, Stefano Gregori*, IEEE International Symposium on Circuits and Systems (ISCAS), 2018
- **Efficiency model of fully-integrated boost dc-dc converters**, *Ahmed Shaltout, Mark Lipski, Stefano Gregori*, IEEE International Symposium on Circuits and Systems (ISCAS), 2018
- **Analysis of PWM and PFM control schemes for integrated step-up DC-DC converters**, *Ahmed Shaltout, Mark Lipski, Stefano Gregori*, IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), 2017
- **Analysis of Boost DC-DC converters with integrated coupled inductors**, *Ahmed Shaltout, Mark Lipski, Stefano Gregori*, IEEE International Conference on Microelectronics (ICM), 2016