Balaji Venkatesh

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Education

Bachelor of Applied Science in Engineering Science with Honours
Major in Electrical & Computer Engineering
University of Toronto | Toronto, Canada *Sep 2020 - Apr 2024*

- Relevant Courses: Computer Architecture [C, Benchmarking], Computer Systems Programming [C, C++], Internetworking, Computer Networks I & II, Signals and Systems, Digital and Computer Systems [Intel Quartus, ARMv7 Assembly], Computer Organization [NIOS II Assembly, Verilog]
- Cumulative GPA of 3.54/4.00, 4th-year GPA of 3.90/4.00
- Dean's Honour List *2020F, 2021W, 2021F, 2022W, 2023F, 2024W*
- Undergraduate Summer Research Program Dean's Pivot Fellowship Award *Sep 2021*

Skills

Professional: Self-lead Research & Development, Collaboration, Management, Problem-solving
Hardware Design: Verilog, HLS, AMD Vivado / Vitis, Intel Quartus, AWS F1 FPGA
Programming: C, Java, Python, Assembly, Scripting, Web Development
Electronics: Microcontrollers (Arduino, Raspberry Pi), Breadboarding, PCB Design, Prototyping

Work Experience

Belief Propagation Accelerator, UG Thesis Research Student [C, HLS, Verilog, AWS FPGA]
University of Toronto | Toronto, Canada *Sep 2023 - Apr 2024*

- Building a hardware accelerator for the residual belief propagation algorithm on AWS FPGA
- Learning task-based speculative parallelism
- Implementing hardware designs with HLS and Verilog and programming with C for RISC-V
- Migrating Chronos scripting from Bash to Tcl

Multi-FPGA Matrix Multiplier , UG Summer Research Assistant [C, HLS, Verilog, AMD FPGA]
University of Toronto | Toronto, Canada *May 2023 - Aug 2023*

- Conceptualized hardware accelerator for very large matrix processing over networked FPGAs
- Designed accelerator cores in Verilog and HLS
- Tested easyDMA direct memory interface using AXI steams
- Programmed application software in C

Altium Education, Platform Development Intern [Web Development]
Altium Limited | La Jolla, California and Remote *Mar 2021 - Mar 2023*

- Developed web platforms and curriculum for courses about printed circuit board design
- Integrated services together with open-source libraries
- Worked with an international team of developers, designers, and teachers
- Presented to over 200 students and industry leaders at the IPC APEX Expo *Jan 2022, Jan 2023*

Doppler Radar Simulator Improvements, UG Summer Research Assistant [MATLAB, Python]
University of Toronto | Toronto, Canada *May 2021 - Sep 2021*

- Improved a simulator for training a doppler radar neural network in MATLAB
- Collaborated with an international research team based in Canada and the UK
- Wrote image processing scripts in Python

Publications

Automation of Thermal Energy Storage for Homes using Artificial Neural Networks [MATLAB]
IEEE Canadian Conference on Electrical and Computer Engineering | London, Canada *Sep 2020*

- DOI: 10.1109/CCECE47787.2020.9255680

Thermal Energy Storage for Homes [MATLAB, Breadboarding, Prototyping]
2018 IEEE International Conference on Smart Energy Grid Engineering | Oshawa, Canada *Aug 2018*

- DOI: 10.1109/SEGE.2018.8499511

Volunteer Experience

Computer Systems Administrator / Webmaster [Scripting, Web Development]
University of Toronto Engineering Society | Toronto, Canada *May 2022 - May 2024*

- Administrating cloud storage, emails, and websites for most (over 50) UofT Engineering Society design teams, clubs, and associated organizations
- Modernizing legacy computing equipment and migrating to cloud services
- Managing an office network

Electrical Team Member [PCB Design]
University of Toronto Robotics for Space Exploration | Toronto, Canada *May 2022 - Aug 2022*

- Conceptualized a circuit board for space rover peripheral power control
- Implemented the neopixel protocol to control LEDs
- Designed the PCB using Altium Designer

Head Mentor and Director [Java, Python, Prototyping]
Markham Community FIRST Robotics Club | Markham, Canada *Jun 2017 - Present*

- Managing finances for a not-for-profit corporation
- Mentoring youth in business strategy, mechanical design, software programming, and team leadership
- Planning outreach events and proposing sponsorships to local businesses

References are available upon request.