Nick Allison

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Education

BSc. Electrical Engineering; Bsc. Computer Science; 2020 – 2026
Minor in Computer Engineering, GPA: 3.93/4.00
University of Calgary

Skills

Hardware:
Digital Design, SystemVerilog, Synopsys Tools (VCS & Verdi), Verilator, Embedded Systems, Electromagnetics Analysis, Circuit Analysis, LTSpice

Software:
C++, C, Rust, GDB, Python, Java, Linux, Git / ClearCase, Bash, CMake, Make, Valgrind, ROS Noetic, Machine Learning

Experience

SoC Design Intern May 2023 – Aug 2024 | Markham, Ontario
Qualcomm
- Hardware Design
  - Implemented, connected, and debugged new module instantiations.
  - Created a script to list every wire and module within a module.
- CMake Implementation
  - Proposed and led a transition to use CMake as the build system.
  - Achieved a best case speed up of 85%, with 67 minutes being the previous best for compilation to 10 minutes as the new best case, or 25 minutes as the average.
- Power Optimized Design
  - Implemented clock gating on DMA module for the display team.
  - Debugging 8-bit fixed point vs. 16-bit floating point power discrepancy.

Robotics Engineering Intern May 2022 – Aug 2022 | Calgary, Alberta
MapaRobo
- Overhauled landscaping robot's localization and navigation. Solved issues with inaccurate conditions with GPS and IMU signals and Kept location accuracy to within 0.02m and 3 degrees.
- Created a custom sensor fusion algorithm based on a Kalman filter in C++, as well as created a custom local path planning algorithm. Lowered accuracy degradation from 10 degrees/minute to 0 degrees/minute.
- Refined perception system to recognize objects at a 2x distance. Lowered false positive rate by 90%.
- Designed and created a convolutional neural network with Pytorch to recognize adverse conditions with a 300% increase in performance from the previous system.

PASS Leader Jan 2021 – Apr 2023 | Calgary, Alberta
University of Calgary - Peer Assisted Study Sessions
- Mentored and tutored first-year engineering students, understanding their levels of understanding. Improved grades of regular attendees by an average of at least 1 letter grade.
- Spoke publicly to 40 - 200 attendees and worked as a team with another PASS leader.

Teams & Clubs

Software Team Lead Jul 2022 – Apr 2023 | Calgary, Alberta
Alberta Collegiate Robotics - Canis Quadruped Team
- Managed a team of 4+ software engineering students.
- Created forwards and inverse kinematics models for robot legs and body in C++.
- Implemented a walking gait model for locomotion using an IMU and PID control for orientation and balance.

Projects

Robot Hand, Helping Hands Jan 2023 – Apr 2023
- Led a team of 6 people to create and program a robot hand to translate speech into sign language.
- Used ROS and C++ to program and control the robot, and natural language processing to transcribe the speech

Signal Generator Dec 2022
- Created a signal generator with an FPGA. Simulated and tested with Verilator.
- Used a linear interpolation core to run at frequencies from 1Hz to 1MHz at 1Hz steps.
- Used an R2R Ladder Digital-Analog-Converter to generate the sine wave.