ABRAR AHSAN

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EDUCATION

B.Eng - Electrical Engineering

Ryerson University — CGPA: 3.06

Sep 2016 – Apr 2022 — Toronto, ON

Minor: Mathematics

EXPERIENCE

Research Assistant - Robotics and Computer Vision

Ryerson University

May 2020 – Present — Toronto, ON

- Researched topics surrounding the use of deep learning methods for robotic navigation applications. Topics focused on camera-based navigation using supervised learning techniques with features learned from image data alone
- Developed shallow convolutional neural network and implemented on a neuromorphic vision sensor for navigation in corridor and racetrack environments using Jetbot chassis
- Academic Paper: CAIN: Automatic Code Generation for Simultaneous Convolutional Kernels on Focal-Plane Sensor-Processors

Computer Vision | Robotics | Deep Learning | Python | C/C++ | Keras

Operations Intern

Independent Electricity System Operator

Jun 2020 – Aug 2021 — Missisauga, ON

- Assisted engineers by performing outage assessments for non-critical outages by going over electrical diagrams of individual stations, documenting contextual information and alerting for critical outages
- Developed and maintained DACP and TR tools, reducing the administrative burden from hours to minutes for the TR tools while simplifying the process for DACP tools

Power System | Python | Tableau | VBA

Programs Analyst

De Havilland Aircraft of Canada/Bombardier

May 2018/19 – Aug 2018/19 — North York, ON

- Transferred the Policy and Procedures Handbook (PPH) framework to Adobe FrameMaker to reduce time spent on updating and creating new documentation
- Developed the Corrosion Reporting and Database Software (CPCP) for the Dash8 and CRJ series aircraft to be used by over 100 airlines for reviewing Corrosion and Maintenance Reports

Maintenance Engineering | Adobe FrameMaker | VBA

EXTRACURRICULAR EXPERIENCE

Electronics Team Captain

Ryerson Cansat

Sep 2016 – Jul 2019

- Designed and implemented the electronic sensor payload using sensors, Arduinos and Raspberry Pi for telemetry collection while ensuring proper power distribution throughout the system
- Designed the PCB boards while coordinating with the team for physical and weight limitations to satisfy competition requirements
- Managed a team of multi-disciplinary students to design and build a miniature space probe with sensor payload for the AAS Cansat Competition

Design Team | Sensors | Eagle | C/C++

SKILLS

Programming Languages & OS
Python(OpenCV, NumPy, Pandas, Keras), C/C++, MATLAB, Java, LaTeX, Bash, Linux, Windows

Design Software
Simulink, Multisim, Eagle, ETAP

Robotic Simulation
ROS, Gazebo

PROJECTS

Autonomous Navigation of Turtlebot in Simulated Gazebo World
Implemented a shallow CNN Robotic Navigation Network using Python and Keras by collecting images from custom Gazebo environments. The network was trained and verified on more image datasets before implementing on a turtlebot for high-speed navigation on racetrack and corridor environments.

Robotics | ROS | Gazebo | Python | Computer Vision | Keras | Deep Learning

Twitch Plays Hackathon
Created a robot that can be controlled by the input of a live audience from Twitch. The motors were controlled using a custom motor-driver based on an H-Bridge using MOSFETs to control the direction and speed of each motor using an Arduino.

Robotics | C | Arduino | Twitch API

Cansat Electronics Sensor Bay
Designed and implemented multiple sensor boards to collect environment data and telemetry before transmitting to a ground station. The system was tested individually, then breadboarded together before transferring to PCB boards designed using Eagle. The sensors were custom modelled on Eagle to ensure a perfect fit. The board's design was verified using Sparkfun's DRU before manufacturing.

Sensors | Arduino | C | Eagle

COURSEWORK

Software
Image Analysis, Image Processing, Algorithms & Data Structure, Intelligent Systems, Software Systems

Hardware
Control Systems, Microprocessor Systems, Power Electronics, Electronic Circuits, Digital Signal Processing