Sean Wu

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Education

BASc | Engineering Science

University of Toronto | 2018–Present

- 3rd year student (ECE Option)
- cGPA: 3.79

Skills

Computer Vision

Software
OpenCV • FFmpeg
Classical Concepts & Algorithms
Homography • Canny Edge Detector
Epipolar Geometry
Machine Learning Based Methods
Convolutional Neural Networks

Software Development

Programming
Python • MATLAB • C • Java
Machine Learning
TensorFlow 2.0 • Scikit-learn
Data Analysis
NumPy • Matplotlib • Pandas
Development Tools
Git • Bash • SSH • Vim • Jupyter
OS
macOS • GNU/Linux • Windows

Hardware & Embedded Systems

FPGA Design
Verilog • Vivado
Embedded Systems
Arduino • Raspberry Pi

General

Languages
English • French • Cantonese

Coursework

ECE/Computer Science

Mechatronics
Data Structures & Algorithms
Digital & Computer Systems
Electromagnetism
Electric Circuits

Mathematics

Differential Equations
Vector Calculus
Linear Algebra
Probability & Statistics

Engineering Experience

University of Toronto | Research Intern

May 2020–Present

- Currently developing new computational imaging applications for coded exposure pixel cameras (stereo camera projector pair)
- Applied classical computer vision concepts (epipolar geometry, disparity, albedo) using Python, OpenCV, and Bash
- Tested Artix-7 based FPGAs using Verilog testbenches and Vivado

National University of Singapore | Student Researcher

May–Aug 2019

- Conducted a detailed literature review and developed a mathematical model for MATLAB simulations of a 1D indirect evaporative air conditioning unit
- Used MATLAB simulations to determine ideal parameter values and design configurations based on various inlet air properties and temperature conditions

Technical Projects

Autonomous Car Charging Robot (Praxis III Mechatronics)

Jan–Apr 2020

- Successfully enabled robot to detect the charging port and determine its relative position (distance and orientation)
- Implemented efficient computer vision detection using homography matrices and Canny edge detection in OpenCV to run on a low-powered Raspberry Pi
- Designed autonomous control system for car charging robot by implementing a finite state machine with simple feedback loops in Python

GPXOverlay Video Editing Library

Sept–Dec 2019

- Designed and programmed a Python library to process GPS data (from GPX files) and overlay it on video input using user-defined HTML templates
- Used NumPy and Matplotlib for storing and graphing data, ElementTree for parsing XML, and FFmpeg for processing video

Extracurriculars

UTMIST (University of Toronto Machine Intelligence Student Team)

Sept 2019–Apr 2020

- Developed a Recurrent Neural Network (RNN) using TensorFlow 2.0, as a part of a larger visual attention model in the Computer Vision Group
- Independently created and maintained online notes written in LaTeX for collaboration with team members

Awards

Engineering Science Research Opportunity Fellowship (ESROP U of T)	2020
3rd/15, U of T Engineering Competition Programming Challenge	2020
Engineering Science Research Opportunity Fellowship (ESROP Global)	2019
Faculty of Applied Science & Engineering Dean's Honours List	2018–2020
Donald C. Leigh Memorial Scholarship Recipient	2018
National AP Scholar (Canada) Award	2018
Governor General's Academic Bronze Medal	2018