Rowan Honeywell

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github.com/rowanhnwl Website

Education

University of Toronto **Toronto, ON, Canada**
Bachelor of Applied Science in Computer Engineering 09/2021 - 05/2025

- **Selected Coursework:** Algorithms & Data Structures, Calculus (I, II, III), Computer Fundamentals (C), Computer Organization, Linear Algebra, Programming Fundamentals (C++), Software Communication & Design, Software Engineering
- **Cumulative GPA:** 3.85 / 4.00

Technical Skills

Languages: C/C++, Python, MATLAB, ARM Assembly
Technologies/Frameworks: OpenCV, Tensorflow/Keras, NumPy, scikit-learn, Verilog HDL, Arduino, Git, LaTeX

Technical Experience

Neural Engineering Laboratory **University of Toronto, Toronto ON**
Undergraduate Research Assistant 05/2022 - 08/2022

- Engaged with **MATLAB**, largely using MathWorks' Signal Processing Toolbox
- Studied and implemented various **signal processing algorithms** such as singular spectrum analysis (SSA) and principal component analysis (PCA) to **remove noise** from an electrovasculargram (EVG) signal
- Experimented with a range of machine learning algorithms using **Tensorflow** and **Keras**
- Relayed technical progress and data in weekly lab meetings

University of Toronto Formula Racing **University of Toronto, Toronto ON**
Senior Perception Member 06/2022 - Present

- Engaged with **OpenCV** and **XGBoost** to implement colour filtering and classification frameworks
- Trained and tested a cascade classifier to detect traffic cones
- Implemented **camera calibration** and undistortion with OpenCV
- Researched, implemented, and tested several **feature matching** algorithms for stereoscopic calibration
- Applied stereo **depth estimation** to generate three dimensional **point clouds**

Medical Computer Vision and Robotics **University of Toronto, Toronto ON**
Undergraduate Researcher 05/2023 - Present

- Engaging with OpenCV, Tensorflow/Keras, and scikit-learn to research **biomedical imaging and computer vision** techniques to aid in fetal surgery
- Interacting with **complex hardware** such as the Franka Emika Research 3 robotic arm and the da Vinci Research Kit by the Intuitive Foundation
- Implemented a real-time **deep learning** and **feature-based** fetoscopic field-of-view expansion framework (**see "Fetoscopic Mosaicking" in "Projects"**)

Projects

Fetoscopic Mosaicking 05/2023 - Present
Medical Computer Vision and Robotics

- **Purpose:** Addressing challenges presented by the poor optical conditions during minimally invasive fetal surgery to treat **twin-to-twin transfusion syndrome (TTTS)**
- Gathered and annotated data from two artificial placentas to train a ResNet-101 convolutional neural network to **segment placental vessels** for the removal of ocular inconsistencies
- Employed **OpenCV** and linear algebra knowledge to create a feature-based image-to-image homography estimation procedure for the generation of accurate **placental field-of-view expansions (panoramas)**
- Developed a testing protocol which utilized the Franka Emika Research 3 robotic arm to help evaluate the framework's performance across different camera trajectories

Projects (continued)

Transit Mapping Application 01/2023 - 04/2023
University of Toronto

- **Purpose:** Collaborating in groups of three to produce a **mapping application using C++** as part of the second-year "Software Communication & Design" course
- Engaged **API calls** to receive and display live weather data and road restriction data
- Implemented **Dijkstra's algorithm** to find the shortest path between two points in minimum time and added an interface to give the user **readable directions** through the path
- **Final course mark: 90% (A+)**

ChessDetect - Repository 01/2023
Personal

- **Purpose:** Given a live screen-capture of a digital chess board, show graphically what the engine-recommended move is using computer vision techniques
- Employed **OpenCV** to determine and encode a chess position given a live screen-capture
- Engaged with the **Stockfish chess engine** to calculate and visual the best move at any position
- **Demonstration on LinkedIn**

Non-technical Experience

Zehrs Food Market **Stratford, ON**
Part-time Worker 08/2020 - 09/2021

- Responsible for sorting perishable foods between both storage and store-front
- Refined **time-management** abilities by coordinating multiple tasks in a fast-paced environment
- Improved **interpersonal skills** through interacting with customers and catering to their needs accordingly, resulting in recognition from management for **excellent customer service**

Awards & Scholarships

Dean's List, All Terms 09/2021 - Present
Faculty of App. Science and Eng., University of Toronto

Dr. David Smith Scholarship ($4800) 06/2021
Rotary Club of Stratford

2021 Loblaw National Scholarship ($1500) 08/2021
Loblaw Companies Limited

Edward S. Rogers Sr. Admission Scholarship ($1500) 09/2021
Faculty of App. Science and Eng., University of Toronto