

SHOUYUE HU

hu.shouyue@outlook.com | GitHub | LinkedIn

EDUCATION

Queen's University, Kingston, Ontario, Canada

Bachelor of Computing, Mathematics minor

Sep. 2018 – Jun. 2022

- CGPA: 3.82/4.3, 3rd and 4th Year GPA: 3.92/4.3
- Excellence Scholarship, Dean's Honour List, Academic All-Star
- Athlete in Fencing Varsity

RESEARCH EXPERIENCE

Lab INIT Robots, École de technologie supérieure, Montreal, QC

Research Assistant

Feb. 2023 – Aug. 2023

Adviser: David St-Onge

- Researched cognitive data for drone pilots for operation performance evaluation
- Created an efficient blink detection algorithm for pupil diameter signal, utilizing dynamic programming, with $O(N)$ time and $O(1)$ space complexity [Source]
- Studied and implemented filters, calibration, and data interpolation
- Produced reports for methods and experiments, collaborated with lab members, supported mechanical students in coding, and presented research demos to lab visitors
- Developed CNNs for cognitive load classification based on audio slices

Queen's University, Kingston, ON

Interactive Melody Generator with Multi-song Fusion

Sep. 2021 – Apr. 2022

Adviser: Ting Hu

- Proposed an Evolutionary Algorithm that generates songs incorporating commonalities and merges the features of input songs based on the user's interactive selections
- Designed and implemented the method, constructed the code architecture

INDUSTRY EXPERIENCE

Strategy Department, Delta Controls Inc., Remote, BC

Junior Developer

Jan. 2023 – Present

Adviser: Jayson Bursill

- Developing building administration autonomous agent powered by LLMs, designing retrieval-augmented generation workflow, quantizing and fine-tuning Llama 2
- Built a workflow that retrieves/analyzes/visualizes database by interactive conversation, and improved edge device request speed by 58% by creating a six-line asynchronism algorithm
- Independently establishing data pipelines including the scripts, visualization tools, and web-based IoT software
- Collaborating closely with the data scientist for proof-of-concepts in HVAC, weekly providing data-driven experimental insights to the CTO

Shuangyuan Optoelectronics Tech Co., Ltd., International

Robotics Engineer Intern

Jul. 2021 – Aug. 2021

- Created a segmentation method for textureless shiny glass, utilizing dynamic projected lights to fuse bright pixels from multiple images
- Engineered pixel-processing techniques for segmentation (Morphological Transformations and gradient), edge detection, and clustering (Hough and K-Means) to calculate product center
- Created a Scara robotic arm control solution with 5 DoF and a repeatability of 0.15mm with calibration and kinematic algorithms
- Developed a multi-thread distributed broadcast pipe to drive the hardware

PERSONAL PROJECTS

Hexapod on RaspberryPi [Source]

Jun. 2021 – Sep. 2021

- Built and drove a hexapod with servo motors, IMU, and RGBD camera
- Self-taught 3D model design that fits the requirements of a 3D printer, welded voltage transformers, and studied SLAM basics

Path Searching Using Evolutionary Algorithm [Source]

Mar. 2021 – Apr. 2021

- Created a path-searching algorithm using stochastic optimization through iterations in the form of an Evolutionary Algorithm
- Enhanced the efficiency by incorporating loop elimination and dead-end avoidance
- The method achieved expedited execution time of path discovery in grids with dimensions greater than $1,000 \times 1,000$ compared to Breadth First Search (BFS)

SKILLS

Languages and Tools: Python, Linux, ROS, C/C++, Docker, Git, Matlab, LaTeX, PostgreSQL, AWS, GCP, JavaScript, Java, Blender, SolidWorks

Packages: Pytorch, CUDA, Numpy, Matplotlib, OpenCV, Pandas, Threading, Conda, Socket, ffmpeg, OpenSMILE, Flask, SciPy

Google Data Analytics Certificate