Mackenzie Snyder

m25snyde@uwaterloo.ca | linkedin.com/in/mackenzie-snyder | Portfolio Website

Skills

Languages: Python (PyTorch, SciPy), C#, C++, Javascript (React.js, Node.js), Typescript, Java, MATLAB, SQL, Kotlin, HTML, CSS
Tools: Git, REST API, AWS, ROS, Docker, MS SQL, PostgreSQL, Postman, Figma, Jira, Android Studio, Firebase, Linux

Work Experience

Undergraduate Research Assistant — *Social and Intelligent Robotics Research Laboratory* Jan 2024 - Present | Waterloo, ON

- Developed a real-time **computer-vision based** object detection algorithm for autonomous pick-and-place robotic applications utilizing **Python** and **OpenCV**. Enabled precise identification and localization of common grocery store objects within a dynamic environment.
- Utilized **Kotlin Skill API** and **Furhat SDK** to develop an interactive robotic game aimed at educating children about bullying and fostering a positive learning environment with the **Furhat social robot**.
- Developed a web application using **React.js** and **Kotlin**, integrating functionalities for sensory applications and user-interactions while leveraging **Google Cloud API**.

IoT Implementation Specialist Intern — *Xandar Kardian Inc.* May 2024 - Aug 2024 | Toronto, ON

- Engineered an operation tool utilizing **Python and Selenium** for the automation of FDA compatible installation tracking for vital sensor devices. Reduced task duration from **3 hours to 2 minutes**, achieving a **98.89%** efficiency improvement and significantly enhancing resource allocation and error detection.
- Created a **Python-based GUI** automation system to streamline documentation processes and email dispatch for new client product deployments. The solution included intuitive control interfaces, reducing a **2 hour** data implementation task to **under a minute.**

Software Engineering Intern — *Unity Health Toronto* Jan 2023 - Dec 2023 | Toronto, ON

- Updated and refactored codebase in **TypeScript**, **JavaScript, and Node.js** to meet industry standards for an Electronic Asthma Management System (eAMS) while ensuring quality and performance through automated testing utilizing **Java**, **Python**, and **Selenium**.
- Designed interactive **UX/UI** wireframes for new product features in **Figma** and translated them into a user-friendly interface using **React.js** enhancing the user experience and accessibility for healthcare providers in **40+** clinics.
- Maintained and updated an **MS SQL** database using **SQL** for the eAMS. Utilized **AWS infrastructure and cloud services** to ensure secure data storage and efficient retrieval, ensuring smooth data operations for the system.

Software Quality Analysis Intern — *Infrastructures for Information Inc. (i4i)* May 2022 - Aug 2022 | Toronto, ON

- Conducted rigorous testing of i4i FDA-approved pharmaceutical labeling templates. Executed assigned test cases with precision and meticulously documented software errors and faults.
- Partnered with co-op team members to develop a conversion tool that extracts data from Excel spreadsheets and translates it into i4i FDA-approved labeling templates. Processed and debugged code written in **Python**, **XML**, and **XSLT**, and implemented GUI modifications using **Figma** for design drafting and the **Tkinter** library for display development, ensuring a user-friendly interface.

Projects

Brain-Computer Interface Controlled Automated Wheelchair

- Engineered an advanced system using **Python** to orchestrate the seamless integration of neural data collection with an LED control script, employing **socket** communication.
- Established a connection between data acquisition and a **ML** model, harnessing **SSVEP** and **motor imagery** techniques to decode personalized brain signals. This solution translated these signals into precise wheelchair movements, ensuring both efficiency and reliability in the transfer of crucial information.

Spiking Neural Network (SNN) Model for Sign-Language Recognition

- Engineered and deployed a cutting-edge **SNN** using the **PyTorch** and **SNNTorch** libraries to accurately recognize American Sign Language (ASL) gestures. Leveraged the ChicagoFSWild ASL video dataset, performing intricate frame extraction, data preprocessing, and tensor transformation to optimize training and testing pipelines.
- Conducted rigorous model evaluation, analyzing loss metrics and accuracy to refine performance and enhance recognition capabilities.

Robotic Voice Generator

- Developed a voice signal processing algorithm in **Python** to transform standard audio recordings into a distinctive robotic voice with precision and clarity. This project involved extensive signal analysis, discrete signal processing, and refined waveform manipulation using the **SciPy** library, resulting in an engaging and unique auditory experience.

Education

University of Waterloo September 2021 - Present | Waterloo, ON

Bachelor of Applied Science in Biomedical Engineering

- Projected option in **Artificial Intelligence and Computing**.
- President's Scholarship of Distinction, President's Research Award, Sanford Fleming Bioengineering Competition Award.