Amhar Rishan

289-556-5327 | mohamedamhar946@gmail.com| linkedin.com/in/amhar-rishan | github.com/rishanm86 | amhar.xyz

Education

McMaster University Hamilton, ON

Bachelor of Engineering in Computer Engineering (CO-OP) *Sept. 2022 – Present*

- Relevant Courses: Digital Systems Design, Data Structures & Algorithms, Microprocessor Systems Project, Principles of Programming

Technical Skills

Languages: Python, C/C++, SystemVerilog, Java, HTML/CSS, JavaScript, Matlab, R
Frameworks: React, Node.js, Flask, Open3D
Developer Tools: Arduino, Autodesk Inventor, Git, Linux, Intel Quartus, PSpice, Microsoft Office, Power BI
Libraries: pandas, NumPy, Serial, Matplotlib

Projects

Real-Time FM Receiver with SDR | *Python, C++* Feb 2025 – Mar 2025

- Designed a real-time Software-Defined Radio system for FM mono/stereo and RDS data reception using RF hardware and a Raspberry Pi.
- Implemented signal processing pipelines for FM demodulation, stereo decoding, and RDS demodulation.
- Optimized **multi-threaded** architecture by separating RF front-end, audio, and RDS data paths to achieve real-time performance.
- Applied **DSP** and digital communications principles in a hardware-software co-design environment.

Image Decompression Program | *SystemVerilog* Sep 2024 – Dec 2024

- Engineered a JPEG decompression system in **SystemVerilog**, designed for FPGA implementation.
- Developed and optimized key components, including Upsampling, Colorspace Conversion, IDCT, Dequantization, and Lossless coding.
- Applied FPGA-based hardware design principles to optimize memory access efficiency and enhance processing performance.

LiDAR3D - Spatial Mapping | *C, Python, Open3D* Jan 2024 – Apr 2024

- Engineered a LiDAR-based 3D scanning system with a VL53L1X Time-of-Flight sensor and ARM Cortex-M4F microcontroller, capturing 360-degree indoor views with a range of up to 4 meters.
- Implemented **I2C** communication between the sensor and microcontroller, facilitating **UART**-based data transfer to a PC and enabling real-time rendering with $<1s$ delay between scan and visualization.
- Developed a detailed 3D visualization of the environment using **Python** and **Open3D**, enabling interactive spatial data analysis.

Note-it - CRUD Note-taking App | *JavaScript, HTML/CSS* Aug 2024 – Sep 2024

- Developed a fully functional **CRUD** (Create, Read, Update, Delete) note-taking application using **JavaScript** for the frontend, leveraging **local storage** to persist user data without the need for a backend database.
- Designed and implemented a responsive and user-friendly interface featuring light and dark modes to enhance accessibility and provide a smooth user experience.
- Utilized **local storage** to manage and store user notes, ensuring quick and efficient data retrieval directly in the browser.
- Built a component-based architecture to isolate functionality, making the application easier to maintain, extend, and test for future enhancements.

Football Match Predictor | *Python, pandas, Scikit-Learn* Jul 2024 – Jul 2024

- Developed a predictive model for Premier League match outcomes, integrating web scraping techniques to collect and process match data using **pandas** for efficient data preparation.
- Applied machine learning algorithms from **scikit-learn** to build and train the model, achieving an **82%** accuracy in predicting match results.