PATRICK HUYNH

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Skills

Programming C/C++ (OpenCV, Eigen), Python (Pandas, NumPy, Matplotlib), CUDA, JavaScript (Node, React), HTML/CSS, MATLAB, R/R Studio

Miscellaneous Linux, Git, Shell (Bash), NVIDIA VPI

Work Experience

Software Engineer

Jan 2023 - April 2023

Martinrea Alfield Industries

Vaughan, ON

- Integrated a modified version of **ORB-SLAM3** using **C++** on a completely vision-based autonomous intelligent vehicle (AIV) resulting in a fully automated delivery transport system
- Collaborated with a team to implement the **SLAM** algorithm by unifying the **Intel RealSense Depth** cameras and **IMU** using the **Extended Kalman Filter**, so the AIV can support autonomous long distance navigation, by removing encoder error accumulation and obtaining global pose
- Developed in a **Linux** environment on **NVIDIA Jetsons** using **CUDA** to parallelize bit-wise masking, resulting in drastic performance boosts in real-time generation of topdowns
- Integrated the **dense optical flow computer vision** algorithm using **NVIDIA VPI** to enable object tracking which allowed the AIV to predict the future location of moving objects resulting in more efficient path planning

Front-end Developer

May 2022 - Aug 2022

Martinrea Alfield Industries

Vaughan, ON

- Implemented a portable and scalable application in **HTML/CSS/JS/React** that unifies different parts of the plant by creating a digital representation of the factory that will be used by various stakeholders including managers, maintainers, integrators, and developers
- Integrated the **Django-based RESTful API** and designed an abstract state management structure using **Redux Toolkit** and **Axios** to manage device registration, map configuration, and user authentication
- Led the development of a maintainable interface for a self-driving autonomous intelligent vehicle (AIV) using advanced **JavaScript/React** design patterns **(HOC, Provider, Hooks)**

Full Stack Software Developer

Sep 2021 - Dec 2021

The Co-operators

Kitchener, ON

- Launched a Business Continuity Plan software using a **MERN** stack so clients can digitize **CRUD** operations of different plans including business model plans used by over **120** clients nation-wide
- Consolidated data from the frontend by centralizing the application state using **Redux** and storing it into the database with **MongoDB**
- Assisted in creating the front-end interface for an A.I. chat bot using **React** and **JavaScript** frameworks providing autonomous customer service for clients and customers
- Collaborated in an **Agile workflow** using **Jira** for ticket management, **Bitbucket** for version control, and **Confluence**

Projects

Biquadris (Tetris)

C++ (OOP), Bash, X11

- Designed and implemented a 2-player Tetris-based game that supports local multiplayer functionality
- Built in **C++** using **OOP** concepts **(polymorphism, SRP)**, memory management principles **(RAII)** and various design patterns (observer, template, factory)

Inventory Stock Bot

Python, BeautifulSoup, Twilio

- Developed a **Python** program to determine product availability used regularly by **4** clients to buy high-demand items during the pandemic
- Accessed, scraped, and parsed the HTML website using the **Requests** and **BeautifulSoup4** library to determine the desired products stock availability every 60 seconds
- Implemented an SMS notification system using the **Twilio API** to notify users when the product is in stock

Education

University of Waterloo

Waterloo, ON

Bachelors of Computer Science, Honours Co-op

Sept 2020 - Current

- Cumulative GPA: 3.9/4, President's Scholarship
- **Courses:** Object-Oriented Software Development, Data Structures and Data Management, Algorithm Design and Data Abstraction