Bryan Melvison

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EDUCATION

McGill University   Jan 2024 - Apr 2024, Montréal
Exchange Semester Winter 2024
Relevant Coursework: Natural Language Processing with Deep Learning, Statistical Learning, Algorithm Design

The University of Hong Kong   Sept 2021 - Jun 2025, Hong Kong
Bachelor of Engineering, Computer Science Major and Finance Minor
Awards: HKU Scholarship *(3 consecutive years)*
Activities & Societies: HKU Student Ambassador; Founder of Lap Chee Running Club; Lap Chee College Ambassador
Relevant Coursework: Software Engineering, Machine Learning, Introduction to Data Science, Data Structure and Algorithm, Object Oriented Programming and Java, Operating Systems, Introduction to Database Management System

WORK EXPERIENCE

HKU Innovation Wing | *Part-Time Research Assistant (Robotics)*   Oct 2023 - Dec 2023, Hong Kong
- Developed computer vision algorithms in OpenCV to perform color detection, contour extraction, and 2D coordinate mapping of colored objects to enable robotic arm calibration for pick and place operations.
- Optimized existing code for autonomous rover bot by refactoring to improve performance and precision.

Kodifly Limited | *AI Engineer Intern*   Jun 2023 - Aug 2023, Hong Kong
- Developed a cutting-edge Web Visualizer to facilitate real-time hosting of live camera feeds, live point clouds from the LiDAR Sensor, on-demand SLAM, and alarm system detection using React js, three js, and ros.
- Built a robust backend infrastructure utilizing the ROS communication protocol, ros.js, and seamlessly integrated Livox SDK API for its detection capabilities on the Web Visualizer.
- Achieved perfect accuracy in IMU calculations for LiDAR simulations, enabled the creation of a realistic SLAM map of the simulated landslide, and moving cars.
- Successfully calibrated the live camera feeds result and overlay them on top of the point cloud feed based on the intrinsic and extrinsic parameters of the camera.

PROJECT & ACHIEVEMENT

McHacks11 Top 5 Finalist | *McGill University's largest hackathon, with over 500 participants*
Pocket Vocab by Purple Cow | *React Native, Flask, Firebase*
- Made the quiz section of the app and the overall backend infrastructure using React Native for the UI and Python Flask for the server-side logic.
- Integrated Google Cloud Vision API for object recognition and annotation, and Google Cloud Translate API for translating object names to the user's selected target language, Gemini API for generating quizzes questions
- Implemented Firebase services, including Firestore for database management, Functions for implementing serverless backend functionality and Storage for storing pictures taken by the user

ML Gallery | *React.js, FastAPI, Docker, PyTorch, TailwindCSS*
- Developing an online ML portfolio showcasing deep learning applications: CNN for digit recognition, GPT for language generation, DistilBert for natural language inference, ELECTRA for Question Answering (QA) system

ODQA - RAG | *Pytorch, Huggingface, MongoDB*
- Implemented a full Retrieval-Augmented Generation (RAG) pipeline for open-domain question answering, according to the Dense Passage Retrieval (DPR) paper. Leveraged SOTA models (ELECTRA, DistilBERT).
- Fine-tuned model to achieve high performance metrics, with a recall of 0.95 and Mean Reciprocal Rank of 0.81.
- Managed data operations with MongoDB, ensuring robust data handling and quick retrieval for real-time question answering.

Intelligent Course Management System | *OpenCV, Flask, MySQL, React.js*
- Developed facial recognition system to enable biometric authentication for course management platform.
- Built a machine learning pipeline including data collection, training, and integrated the model with the backend.
- Front-end and backend integration using Flask and MySQL for various functionality.

SKILLS

Languages: Bahasa Indonesia (Native), English (Native), Chinese Mandarin (Working Proficiency / HSK 5)
Programming Languages: Python, R, Java, JavaScript, C/C++
FullStack: React js, TailwindCSS, Three js, Next js, MySQL, MongoDB, Node, Express, Flask
Data Science and ML: Tidyverse, Pandas, Numpy, Scikit Learn, Matplotlib, OpenCV, PyTorch, Huggingface
Cloud & Others: Firebase, Ros, Git, Linux