Jack Douglas

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Education

University of Waterloo — Waterloo, ON
Bachelor of Software Engineering — *September 2019 – April 2024*
- Average: 90% - 6 x Term Distinction List - Recipient of the President's Scholarship of Distinction

Technical Skills

Languages: Python, C/C++, Java, Kotlin, Solidity, JavaScript, TypeScript, SQL, MATLAB, R
Libraries: TensorFlow, Keras, PyTorch, scikit-learn, OpenCV, NumPy, Transformers, Diffusers, pandas
Technologies: Kubernetes, Docker, gRPC, Amazon Voice Services (AVS), AWS, PostgreSQL, uWSGI, Flask

Experience

Apple — Cupertino, CA
AIML Intern — *January 2023 – April 2023*
- Trained an MLP for classifying failed pipelines on sentence embeddings generated with BERT using **Python** and **scikit-learn**, which obtained a **90.4%** accuracy and **0.90 macro-averaged F1 score**
- Leveraged the MLP to create a triaging service built with **Python**, **Docker**, and **Kubernetes** that classifies Siri pipeline failures to save **100+ idle hours per week** and **12.5 manual screening hours per week**

NVIDIA — Santa Clara, CA
Autonomous Vehicles Software Engineering Intern — *May 2022 – September 2022*
- Developed and scaled a user management system for the in-car voice assistant from driver to all passengers using microphone beamforming in **Python** and **gRPC**; to be used in NVIDIA partner vehicles such as Mercedes-Benz
- Prototyped a multi-assistant system with wake word detection that fulfilled context-dependent queries using **AVS**
- Designed a pipeline which extracts car manual data used for training voice assistant models using **Pytesseract**

BitGo — Palo Alto, CA
Software Engineering Intern — *September 2021 – December 2021*
- Created an internal tool for asynchronously comparing data stores of blockchain indexers using **TypeScript**, and used the tool on **100,000+** indexed Ethereum blocks to assist in migrating between Ethereum execution clients
- Designed a new approach in **Java** and **Kubernetes** for indexing and storing Ethereum blocks using event logs and opcode traces that corrects wallet balance discrepancies caused by unidentified internal transactions

BlackBerry — Mississauga, ON
Research and Software Developer — *January 2021 – April 2021*
- Created a thread manager in **C++** to resolve the producer-consumer synchronization problem between microservices on the intelligent vehicle data platform
- Trained CNN models for facial verification in **TensorFlow** and **Python**, with **Keras** for hyper-parameter tuning, which achieved **86%** accuracy

Research / Leadership

Undergraduate Research Assistant — Paper
Machine Learning Researcher (Professor: Gautam Kamath) — *May 2022 – Present*
- Researching how data poisoning and camouflage sets can be used for adversarial machine unlearning attacks on image classifiers using **PyTorch** and **Keras** (accepted to Trustworthy/Socially Responsible ML at NeurIPS 2022)

UWaterloo Data Science Club — Lectures
President (January 2022 - August 2022), Lecturer — *September 2020 – Present*
- Lectured to hundreds of club members about neural networks with **TensorFlow**, recommender systems and clustering algorithms with **scikit-learn**, and diffusion models with **PyTorch** and **Diffusers**
- Led 25+ execs and 6 sub-teams in organizing weekly educational workshops, industry events, and research panels

WATonomous
Path Planning Core Member (Autonomous Vehicle Research) — *June 2021 – December 2021*
- Improved the mAP of the 3D-RetinaNet baseline for action class detection on low-instance classes by using denser data augmentation and the focal loss cost function with **PyTorch** in **Docker** environments