

Siddharth Arya

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EDUCATION

University of Toronto

Toronto, ON

B.S. in Computer Science (Minor in Statistics and Math) GPA: 3.89

Expected May 2025

- Recipient of University of Toronto International Scholar Award - Scholarship
- Coursework: Data Structures, Discrete Maths, Algorithms, Digital Circuit Design, Machine Structure and Assembly-language Programming, Linear Algebra, Software Design (Clean Architecture, Design Patterns), Probability, Statistics, Intro to Data Science, Intro to Machine Learning, Operating Systems, Computer Vision, Natural Language Processing (NLP), Deep Learning

TECHNICAL SKILLS

Languages: Python, C, SQL (Postgres), Java, JavaScript, Typescript, HTML/CSS, R

Frameworks: React, Node.js, ExpressJS, JUnit

Developer Tools: Git, Docker, Microsoft Azure, AWS, Linux(Shell scripting), VS Code, Slurm Workload Manager

Libraries: PyTorch, Pandas, NumPy, Matplotlib, Scikit-Learn, Pytest, Hugging Face (transformers)

EXPERIENCE

Research Intern: Machine Learning

May 2024 - August 2024

Data Science Institute, University of Toronto

Toronto, ON

- Engineered a novel Machine Learning based method to **monitor and evaluate performance of deployed Deep-Neural-Networks**, achieving a **93% True Positive Rate** in foreseeing model failure, ensuring **proactive model reliability and performance** - in collaboration with peers at the Vector Institute of Technology
- Organized and cleaned data for over **~ 200,000 patients** into **900 features** (lab results, vitals, demographics) using **SQL** and **Numpy**, and trained neural networks to achieve **~95%** accuracy in predicting 14-day mortality
- Led a comprehensive benchmark study evaluating the performance of various shift detection methods, implementing solutions in **PyTorch** and **Scikit-learn** for both real-world medical and semi-synthetic data shifts, funded by the **Data Science Institute at the University of Toronto**
- Presented at Showcase Day among **cohort of grant recipients**: highlight importance of **Reliable AI**

Software Engineering Intern

September 2023 - December 2023

Oot Social Inc

Toronto, ON

- Developed **back-end infrastructure** for new feature on 'Oot' mobile app using **Node + Express Js (with Typescript)** and **MYSQL database**, using around **Clean Architecture** and ensuring well documented code
- Deployed server prototype supporting **7 RESTful API Endpoints** with **authentication middleware** for safety
- Established **CI/CD** pipeline through **Github actions** for **automated unit and integration tests** with Jest and seamless deployment to **Azure** on release
- Collaborated effectively using **Agile workflow** and **Jira tickets** in order to plan and meet client requirements

PROJECTS

Low-light, High-speed Imaging | *Numpy, SPAD-512 Interface*

September 2024 - *Current*

- Supervised by **Prof. Kyros Kutulakos** at **Toronto Computational Imaging Group**
- Conducted experiments to characterise key behaviour in SPAD-512 (single photon avalanche diode) camera
- Developed on **Fourier Probing Regime** on photon timestamp data for **higher SNR** ratio of resulting image

Selective Facial Recognition | *Pytorch, Hugging Face*

September 2024 - *Current*

- Supervised by **Prof. Marsha Chechik** at **Department of Computer Science** at the University of Toronto
- Explored auxiliary **Image Captioning** model to tag inputs at test-time in order to construct **Functional Requirements for Machine Vision Component in Facial Recognition Software**
- Developed Facial Recongnition Model with abilitiy to refuse to predict on images with obscured faces

Novel KNN modification | *Pandas, Numpy, Scikit-learn*

September 2023- December 2023

- Implemented and Benchmarked several techniques - **KNN, Principle Component Analysis** and **Decision Trees** - on their efficacy for classification on the MNIST Dataset using **Scikit-Learn**
- Explored a Novel Modification on the KNN, which **reduced input features by 87%** while ultimately achieving **93.09% accuracy** on classifying inputs on the MNIST dataset