Sid Gupta

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Education

University of Toronto · B.Sc Sept. 2017 – May 2022

Computer Science Specialist, Math Minor · Final two years GPA: 3.73

Teaching Assistant: Discrete Math · CS I · CS II

Coursework: Machine Learning · Neural Networks · Probablistic Learning · Computer Vision
Natural Language Processing · Security · Algorithms · Operating Systems

Experience

Machine Learning & Health Researcher · TensorFlow · OpenCV · Scikit · Pandas Toronto, ON

University of Toronto Apr 2021 - Sept 2021

- Built versatile machine learning systems for a new kind of COVID-19 rapid diagnostic test (RDT), that anaylzes images of the RDT, and emulates clinical predictions for everyday users
- Engineered a software architecture that first processes RDT images using OpenCV, then generates hand-crafted image features, and finally trains various machine learning models using Scikit, Keras, and Pyro
- Re-applied the same architecture on a different dataset for blood-typing, and published the innovative results in a top peer-reviewed healthcare journal (Clinical Chemistry 2021)

Computer Vision Researcher · TensorFlow · PyTorch · OpenCV · Keras Toronto, ON

University of Toronto June 2020 - Sept 2021

- First author of a computer vision paper (BMVC 2021) that introduces an algorithm for edge completion, and integrates it with inpainting CNNs to significantly improve SSIM scores against state-of-the-art
- Modified image inpainting models in Tensorflow to process completed edges on top of masked image regions
- Built custom generative models in PyTorch (variants of UNet, ResNet) that show how CNNs can extract prior shape features without any training – just by training and overfitting on one image

Software Engineering Intern · Typescript · GraphQL · PostgreSQL · React Cupertino, CA

Apple Jan 2020 - Apr 2020

- Built a ticketing API service that reads errors from hardware devices, and assigns tasks to internal engineers
- Implemented a 'ticket search' feature with GraphQL query and mutation endpoints; enabling a client to query for tickets by attributes such as device code, unit #, build version, etc. Connected ticket generating sources to use this API, and built a React frontend to display search results

Software Engineering Intern · C++ · C · Make · Bash · FPGAs San Jose, CA

Intel May 2019 - Dec 2019

- Built a C++ model that can track the speed of a hardware chip (i.e, number of clock cycles for completion), after reading the technical chip design, and modifying Makefiles in a codebase compilation with 15K+ lines.

Machine Learning Projects

Aphrodite - Data Science Lead Scikit-SDK · Pandas · React · Node Sept 2020 - Present

- Co-engineered a web-platform and algorithm architecture used by 30,000+ university students, where students can fill out a personality survey, and get matched with another user with a compatibility algorithm
- Trained ML classifiers to predict relationship success, using data from a follow-up survey. Applied model interpretability algorithms (SHAP, boosting) to highlight what survey answers indicate relationship success

Interpreting iTracker PyTorch · Open-CV · NumPy Feb 2021 - Apr 2021

- Applied interpretability algorithms (DeepDream, SmoothGrad) on a state-of-the-art CNN for eye-tracking. Conducted ablation experiments to show the impact of different input branches on model output

Visualizing ML Fairness TensorFlow · TensorBoard · Keras Feb 2021 - Apr 2021

- Visualized the impact of two adverserial ML models that enforce fairness (LAFTR, Adverserial Debiasing) by plotting PCA embeddings, fair objectives, and weights; comparing the effects of fair versus unfair models

Skills

- **Languages**: Python · C · C++ · Java · TypeScript · MATLAB · Julia
- **Technologies**: PyTorch, TensorFlow, Keras, NumPy, Pandas, OpenCV, Scikit-SDK, React, GraphQL