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 · Algorithms · Security · Operating Systems

Experience

University of Toronto April 2021 - Present

Healthcare Machine Learning Researcher TensorFlow · OpenCV · Scikit-SDK · Pandas Toronto, ON

- Built versatile machine learning systems for analyzing images in a new stream of COVID-19 RDTs (rapid diagnostic tests), in collaboration with biochemistry researchers
- Engineered a software system to pre-process rapid-test images using Open-CV, generate hand-crafted features, and train various machine-learning models using Scikit-SDK, Keras, and Pyro
- Re-trained the same final model on an analagous problem (blood-typing), and published the results in a top peer-reviewed healthcare journal (Clinical Chemistry 2021)

University of Toronto June 2020 - Present

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

- 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 performance
- 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 extract prior shape information

Apple Jan 2020 - Apr 2020

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

- 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

Intel May 2019 - Dec 2019

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

- 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.

ML Projects

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

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

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

- Applied interpretability algorithms (DeepDream, SmoothGrad) on an eye-tracking CNN, conducting experiments that disconnect different branches, and visualize the resulting outputs

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

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

Skills

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