# Akshay Trikha

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## Education

**Harvey Mudd College** 2017 – 2021
*Bachelor of Science in Computer Science* *Claremont, CA*

Last 2 Years GPA: 3.634. Selected coursework: Machine Learning, Scientific Computing, Natural Language Processing, Materials Science of Energy Conversion & Storage, Quantum Physics, Microprocessors.

## Skills

Technical: Python (TensorFlow, NumPy, SciPy, Scikit-learn, Pandas, OpenCV), C++, C, JavaScript (TensorFlow.js), React, Vue, SQL, HTML/CSS, Java

Natural Language: Hindi (fluent), Mandarin (conversational), Sanskrit (learning), English (fluent).

## Experience

**QuantumScape** 09/21 – Present
*Software Engineer & Machine Learning Engineer* *San Francisco, CA*

- Design & manage ML-based image processing pipelines to detect defects, make manufacturing scrapping decisions, and support materials research.
- Use Landing AI for segmentation, object detection, and classification model development. My 9 models in production run inference ∼22,000 times / day.
- Develop features for a dashboard built with Vue.js able to efficiently handle ∼100GBs / day worth of image data.

**Sandia National Laboratories** 09/20 – 05/21
*Researcher, 9-person team* *San Francisco, CA*

- Investigated link between diameter of ferroelectric barium titanate nanoparticles and dielectric constant.
- Created a Jupyter Notebook / Python image processing pipeline using OpenCV, NumPy, and Matplotlib to extract particle sizes and distribution from transmission electron microscope images. Then optimized runtime 25x by using Numba library.
- Presented at Materials Research Society '21 Spring Meeting & published in MRS Advances, link at tinyurl.com/sandia-paper.

**AMISTAD Lab** 05/19 – 12/19
*Researcher, 6-person team* *Claremont, CA*

- Explored why machine learning works from an information theory and search perspective.
- Co-authored *The Bias-Expressivity Tradeoff*, won best paper award for ICAART2020 in Valletta, Malta.
- Co-authored *The Futility of Bias Free Learning*, which team presented at AI2019 in Adelaide, Australia.
- Created tinyurl.com/amistad-futility to communicate research findings in more accessible manner.

**Coinhako** 07/18 – 08/18
*Software Engineer Intern* *Singapore*

- Helped develop SmartWallet, a crypto to crypto exchange platform that is in production.
- Wrote and tested smart contracts in Solidity for handling ERC20 token transactions, two of which are now in production with >100k users.

## Projects

**Neural Style Transfer** | *JavaScript, React, HTML/CSS* 07/21 *San Francisco, CA*

- Created a neural style transfer web app that generates stylized images of webcam input in near real time.
- Used a pretrained TensorFlow.js model, link at styletransfer.art.

**Flow Battery Simulation** | *Jupyter Notebook* 05/20 *Singapore*

- Characterized single cell vanadium redox flow battery discharging by numerically integrating a system of governing differential equations in a Jupyter notebook.
- Python packages: SciPy, NumPy, Matplotlib. Link at tinyurl.com/flow-battery-sim.

**AES Encryption** | *C, SystemVerilog* 06/2020 *Claremont, CA*

- Built a hardware implementation of AES FIPS 197 encryption specification using an FPGA that ran in 300 nanoseconds (excluding SPI transfer from a microcontroller)
- Software implementation using C ran on average 13715.3 ns, or 45x slower. Link at tinyurl.com/akshay-aes.