Ansh Sharma

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Education

University of Illinois at Urbana-Champaign, GPA: 4.0/4.0 — Expected May 2024
B.S. in Computer Science, Minor in Mathematics, Chancellor's Scholar — *Champaign, IL*

Work Experience

Amazon — Summer 2022
Incoming Software Development Engineer Intern — *Seattle, Wa*

AbbVie — Jan. 2022 – Present
Machine Learning Intern — *Chicago, IL*

- Conducted research on precision medicine using Deep Learning and Image Segmentation with the Pharma Discovery team
- Transfer learned CV models to segment kidneys from MRI scans to quantify disease progression in PKD-infected mice
- Trained unsupervised models with multiomic data to create a novel quantitative imaging biomarker to predict drug response

Molecule Maker Lab Institute — Dec. 2022 – Present
Undergraduate Research Assistant — *Champaign, IL*

- Researched accelerating enzyme optimization using machine learning guided directed evolution
- Worked on biomedical entity relationship extraction to datamine research papers for future use in deep learning models
- Utilized computer vision models to extract further reaction information from diagrams in research papers

NJ Governor's School in the Sciences — July 2020 – Aug. 2020
Quantum Computing Researcher — *Madison, NJ*

- Published a research paper on the Qiskit quantum computing framework's ability to execute various quantum algorithms.
- Tested the frameworks accuracy with molecular simulation using the Variational Quantum Eigensolver algorithm
- Designed an original probabilistic oracle to pair with Grover's algorithm in order to optimize solving a partitioning problem

Activities & Honors

NeuroTech@UIUC — Aug. 2021 – Present
Software Developer — *Champaign, IL*

- Collected data and implemented ML models to control an RC Car using through readings from a brain computer interface
- Reached 87% live accuracy in classifying facial expressions as instructions using engineered features from the EEG data

Olympiad Awards: Putnam Top 500 - Winter 2020, USA Math Olympiad (USAJMO) Qualifier - Spring 2019, USA Computing Olympiad (USACO) Gold Division - Spring 2019, USA Physics Olympiad (USAPhO) Top 50 - Spring 2021

Research Awards: Regeneron International Science and Engineering Fair Finalist (2021), North Jersey Regional Science Fair 1st Place Computer Science (2021), Nokia Bell Labs Distinguished Research Award (2021)

Selected Projects

Infected & Detected | *TFLite, OpenCV, Flask, MongoDB*

- **HackIllinois 2022: Best Community & Sustainability Track Project**
- An ML based edge computing tool to help farmers get analytics on their crop health and invasive weed growth over time
- Trained an image classifier using transfer learning on MobileNetV2 to identify different types of plant diseases and weeds
- Used pruning and quantization to shrink model size further by 10x to run quickly on a Rasberry Pi with a Coral Edge TPU

Passport Photo Generator | *Python, OpenCV, Node.js, JavaScript, Express, HTML/CSS*

- Built a locally hosted website to convert an inputted image into a passport photo satisfying U.S. passport requirements
- Implemented face detection, image rotation, centering, and alignment using OpenCV
- Incorporated the U^2-net deep learning architecture for salient object detection to remove background

Improved Quantum Cryptography with Entanglement & Signatures | *Python, Qiskit*

- Presented at the 2021 Regeneron International Science and Engineering Fair and the North Jersey Regional Science Fair
- Designed a modification of the BB84 QKD Algorithm to improve on qubit efficiency and prevent man-in-the-middle attacks
- Implemented and tested the algorithm using the Qiskit library to run algorithm on IBM cloud quantum computers

Technical Skills

Proficient: Java, Python, C++, LaTeX, SQL, Linux Shell, Git, Pytorch, Pandas, Numpy, MatPlotLib, OpenCV, Qiskit

Familiar: JavaScript, HTML/CSS, Node.js, Express, Bootstrap, Sass, Catch2, Flask, OpenGL, Tensorflow, Keras