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

AbbVie, *Machine Learning Intern – Champaign, IL* Jan. 2022 – Present
- Conducted research on precision medicine using Deep Learning and Image Segmentation with the Pharma Discovery team
- Utilized radiomics/computer vision to track disease progression in PKD-infected mice to quantify treatment responses
- Paired radiomic + genomic data to find potential biomarkers to predict drug response - working to generalize to human data

PeopleWeave (Caesar Lab @ UIUC), *Undergraduate Research Assistant – Champaign, IL* Dec. 2021 – Present
- A networking application to help connect and study interactions between researchers - to be premiered at SIGCOMM 2022
- Designed a scraper to collect all CS research papers from ACM and IEEE and store in graph and SQL databases
- Used Semantic Clustering to extract and visualize meaningful information and relations based on research paper content

Molecule Maker Lab Institute, *Undergraduate Research Assistant – Champaign, IL* Jan. 2022 – Present
- Researching accelerating enzyme optimization using machine learning guided directed evolution with Dr. Haiyang Cui
- Working on processing and visualizing data from the AlphaFold Protein Structure Database for use in deep learning models

NJ Governor's School in the Sciences, *Quantum Computing Researcher – Madison, NJ* July 2020 – Aug. 2020
- 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
- Utilized PyTorch and scikit-learn to test/train various models including LSTMs, SVMs, Random Forests and DNNs
- Reached 93% real-time accuracy in classifying directions based on facial expressions and eye-blinks

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

EscapeMaze | *C++, OpenGL, CMake, Catch2* Nov. 2021 – Dec. 2021
- Created a maze game in which a player is tasked to escape a series of regenerating mazes while being chased by bots
- Incorporated DFS maze generation algorithms to create realistic mazes and modified BFS algorithms to direct the bots
- Built a test suite in Catch2 to cover 80 percent of the codebase with unit and system tests

Passport Photo Generator | *Python, OpenCV, Node.js, JavaScript, Express, HTML/CSS* Aug. 2021 – Sept. 2021
- 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* Aug. 2020 – March 2021
- 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, Django, OpenGL, Tensorflow, Keras