Kargi Chauhan

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Work Experience

- **3UM** — Remote, USA
  Software Engineer - ML — *April 2024 - Present*
  - Fine-tuned **Large Language Models** using PyTorch and Huggingface, achieving up to a **25%** improvement in model accuracy and efficiency.
  - **Optimized** fine-tuning and **inference** with advanced techniques (**KV cache**, reduced precision, **Multi Query Attention**, Rotary Embeddings) and integrate into cloud-based products, enhancing performance of **distributed NLP** system.

- **NASA JPL - SpaceTrex** — Arizona, USA
  Software Engineering Intern - ML — *Feb 2024 - May 2024*
  - Designed advanced **attitude estimation** and lighting systems for a CubeSat satellite, achieving precise pose estimation using **singular vision** sensors.
  - Trained **multi-modal** neural networks and managed hardware design, test, and validation, achieving **97%** accuracy on synthetically developed real-time data sets comprising **100,000 million** records.
  - Developed **spacecraft pose estimation algorithms**, accurately identifying camera position changes from image data on hardware similar to NASA's R5 CubeSat, contributing to the NASA Johnson Pose Estimation Challenge.

- **Mining Engineering** — Arizona, USA
  Data Science Intern - ML,VR — *Feb 2023 - April 2024*
  - Designed and implemented a realistic **virtual replica** of the St.Xavier Mine in Arizona, incorporating advanced technological features and expert collaborations.
  - Optimized algorithm efficiency for **A* and Dijkstra** pathfinding, cutting down execution times by **23%**, which significantly improved navigational latency and responsiveness in Mine simulation.

- **Tech Core** — Arizona, USA
  Software Developer Intern — *June 2022 - Aug 2022*
  - Delivered RESTful Web APIs using **Node.js** and utilized **Microservices architecture,** employing an **API Gateway** to manage and coordinate the overall architecture.
  - Architected and deployed **GraphQL** APIs using **Apollo server**, enhanced **MongoDB** and **Elasticsearch** pipelines through indexing and query optimization, resulting in **50%** faster data retriveal and **20%** less server load.

- **GirlScript Summer of Code** — Remote, USA
  Software Developer Intern — *Jun 2021 - Aug 2021*
  - Developed features for a transaction web application as a **full-stack developer**, using **React**, Redux, **Angular**, and **MySQL**. Reduced ticket submission form loading time by **40%** through code optimization.
  - Developed using **Node.js**, **Knex.js**, and **Bookshelf.js** to optimize and streamline ticket processing operation resulting in a remarkable **80%** decrease in the time required to complete the transaction.

Skills Summary

- **Languages & Frameworks**: Python, C++, C#, PHP, JavaScript, ReactJS, HTML, CSS, Swift, Flask, MongoDB, MySQL, golang
- **Software Development**: Git, Docker, Kubernetes, AWS(Lambda, EC2), Unity3D
- **Machine Learning**: PyTorch, Scikit-Learn, Apache Spark, Hadoop, Pandas, NumPy, Matplotlib, Seaborn

Education

- **University Of Arizona** — Arizona, USA
  BS in Information and Data Science, Minor in Game Design and Development — *2020 - 2024*
  Relevant Courses: Software Development, Data Structures and Algorithms, Machine Learning — GPA: 3.9 / 4.0

Selected Publications

- **Kargi Chauhan**, Vishnu Pendyala, "*Large Language Models and XAI*" (Under Review)
- **Kargi Chauhan**, Athip Thirupathi Raj, Jekan Thangavelautham, "*Enabling Deep Space Using Inspectors Accompanying Small Spacecraft System of System Architecture*", Interplanetary Small Satellite Conference, NASA JPL 2024. *Paper*
- **Kargi Chauhan**, Angelina Anani, Sefiu Adewuyi, "*From Mines to Minds: Exploring Immersive Learning's Influence in Mining Engineering Education*", UR Inspiration a Undergraduate Research conference *Paper*
- Hannah D Budinoff, Andrew Wessman, **Kargi Chauhan**, "*Using online learning modules to improve students' use of technical standards in additive manufacturing courses and projects*", ASEE 2023. *Paper*

Academic Projects

- **Pose Bowl: Spacecraft Detection and Pose Estimation Challenge**: Developed computer vision algorithm for spacecraft camera position estimation improving NASA's R5 inspection accuracy by 97%, **enhancing mission safety in space**. Code
- **Metropolis - Hastings MCMC Inference of 3D Line**: Implemented Metropolis-Hastings MCMC to estimate 3D line parameters from noisy 2D images, generating samples, finding MAP estimates, and using dual-camera data for 3D modeling in autonomous systems. Code