Kargi Chauhan

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Work Experience

- **SJSU Research Foundation** — California, USA
  Student Researcher - ML, XAI, NLP — *August 2024 - Present*
  - Developed **XAI-driven NLP solutions**, leveraging BERT, spaCy, and SHAP for transparency.
  - Explored bias and explainability in **LLMs with LangChain and OpenAI APIs**, designing fairness metrics for AI systems system.
- **3UM** — Remote, USA
  Software Engineer - ML, LLMs, GenAI — *April 2024 - Present*
  - Fine-tuned **Large Language Models** using PyTorch and Huggingface, achieving 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 the performance of **distributed NLP** system.
- **NASA JPL - SpaceTrex** — Remote, USA
  Software Engineering - ML/AI — *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.
- **Tech Core** — Arizona, USA
  Software Developer Intern - Backend — *June 2022 - Aug 2022*
  - Built data pipelines and **RESTful APIs** using **Node.js** and **Express.js**, enhancing application performance by **35%**.
  - Implemented **GraphQL** APIs with **Apollo Server**, reducing server load by **20%**.
  - Managed deployment infrastructure with **Docker**, **Kubernetes**, and **ArgoCD**, improving deployment efficiency.
  - Optimized complex SQL queries in **PostgreSQL** and **Elasticsearch**, achieving **50%** faster data retrieval.
- **GirlScript Summer of Code** — Remote, USA
  Software Developer Intern - Full-stack — *Jun 2021 - Aug 2021*
  - Developed features for a transaction web application using **React**, **Redux**, **Angular**, and **MySQL**. Reduced form loading time by **40%** through optimization.
  - Optimized backend services using **Node.js**, **Knex.js**, and **Bookshelf.js**, decreasing transaction processing time by **80%**.
  - Implemented secure authentication protocols, increasing application security and user trust.

Skills Summary

- **Languages & Frameworks**: Python, C++, C#, Java, ReactJS, HTML, CSS, Swift, MySQL, Node.js, R
- **Software Development**: Git, Docker, Kubernetes, RESTful APIs, Microservices, AWS(Lambda, EC2), Unity3D
- **Machine Learning**: PyTorch, Scikit-Learn, Apache Spark, Hadoop, Scikit-Learn, Matplotlib, Seaborn

Education

- **University Of Arizona** — Arizona, USA
  BS in Information Science Emphasize Machine Learning 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