SUSHANT GAUTAM

Starkville, MS

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EDUCATION

Master in Computer Science, *Mississippi State University* Expected 2025

Relevant Coursework: Algorithms, Cloud Computing, AI Robotics, Autonomous Vehicles, Data Science, Data Analysis, Deep Learning, and Machine Learning. GPA: 4.0.

EXPERIENCE

Graduate Research Assistant Aug 2023 - Present

Mississippi State University *Starkville, MS*

- Conduct research in the Research Lab for Robotic and Perception Technology (RAPTOR) of Dr. Jingdao Chen's in the field of computer vision focused on Generative AI.
- Enhanced **image restoration** accuracy by 20% through GAN and Diffusion Models in collaboration with **Stanford**, **Princeton**, and **BlueHalo**.
- Streamlined the machine learning model deployment process through **CI/CD pipelines** using **GitLab CI/CD, Docker**, and **Airflow** for automatic spin of containers over AWS EC2 instance and deployment of ML models through kubernetes.
- Optimized **model performance metrics** using **Pytorch-Lightning**, **Optuna**, and **Scikit-learn**.
- **Technologies used**: Pytorch, Tensorlfow, Mlflow, MLOps, Scikit-learn, Kubernetes, AWS Sagemaker, Optuna, Docker.

Machine Learning Engineer Feb 2023 - Aug 2023

Proxmed Pty. Ltd. *Victoria, Australia*

- Implemented a Large Vessel Occlusion (LVO) detection system using **YOLOv7** which is more accurate in the segmentation and classification of infected areas in converted 2D CT-SCAN image, raised accuracy overall by 8% and revenue by 10%.
- Deployed models via **AWS Lambda** with a serverless configuration, reducing inference time by 5.5%.
- Spearheaded **CI/CD pipeline development** and containerization with **Docker** and **Kubernetes**.
- Developed **Distributed-GPU Training** strategy and applied model **quantization** using tools like **TorchScript, ONNX** to optimize model inference, reducing computation time for real-time predictions.
- **Technologies used**: PyTorch, YOLOv7, AWS Lambda, Docker, Kubernetes, Label Studio.

AI Research Scientist - Contract Work Feb 2022 - April 2022

HeHealth Inc. *San Francisco, CA*

- Enhanced classification accuracy by 7.25% by developing synthetic datasets using Dataset-GAN and advanced Few-shot Learning techniques, resulting in improved model performance.
- **Technologies:** GAN, Few-shot Learning, PyTorch, Tensorflow, Data Augmentation.

Machine Learning Engineer Oct 2020 - Oct 2021

Wiseyak Inc. *Bellevue, WA*

- Managed a cross-functional AI team, driving an **8.25% improvement in the accuracy of disease recognition models** for AI-assisted **medical diagnosis**, which led to **4.12%** improvement in customer satisfaction rate.
- Developed and optimized **medical image diagnosis pipeline** that reduced false positives by **60%**, leveraging **custom machine learning pipelines** from scratch tailored for in-house use.
- **Technologies used:** TensorFlow, PyTorch, CI/CD, MLOps, Mlflow, Containerization(Docker), SQL, SQLAlchemy, React.

PROJECTS

- **End-to-End MLOps Pipeline for Image Classification with AWS Sagemeaker**: Implemented a complete MLOps pipeline for an end-to-end image classification task with AWS Sagemaker.(GitHub)
- **Realtime Data Streaming Data Engineering Project**: Used **Airflow**, **Python**, **Apache Kafka**, **Apache Zookeeper**, **PySpark**, **Docker compose** and **Cassandra** for real-time data streaming. (GitHub)
- **Self-Driving Car**: Developed a minimalist autonomous vehicle using **Deep Learning** and **PyTorch** for navigation. (Github)
- **Handwriting Recognition using Deep Learning** Built an OCR tool that converts handwritten text to digital text for research purposes during my undergraduate thesis with a CER of 3.04%. (Github)
- **Related project work for the Graduate Course :Build Autonomous Tractor at Mississippi State University** where I led the project to build autonomous tractor with integration of LIDAR, GPS, Actuator, Sensors and RGB-D Camera. (Github)

ACTIVITIES & LEADERSHIP

President, MSU AI Club *Mississippi State University,* Jan 2024 - Jan 2025

- Organized hands-on workshops on **Neural Networks**, **MLOps**, and **Generative AI**, alongside coordinating coding competitions, lab tours, and AI seminars to foster collaboration and AI education within the university community.
- Organized a coding competition where participants built an image classifier to classify campus buildings, promoting real-world AI applications and model development.

SKILLS

Programming Languages:	Python, R, Java, C++, Scala, Bash, SQL
ML/AI Tools:	PyTorch, TensorFlow, Scikit-Learn, Keras, Pytorch-Lightning, HuggingFace
MLOps Frameworks:	Kubeflow, MLflow, Airflow, ZenML, DVC
Cloud Technologies:	AWS (S3, Lambda, EC2, Sagemaker), Azure, GCP
Data Engineering:	Apache Spark, PySpark, Airflow, Kafka, Zookeeper, Cassandra
Deployment Tools:	Docker, Kubernetes, Git, Jenkins, GitLab CI, FastAPI, Flask, SQLAlchemy
Technologies:	SQL, Model Deployment, Model Quantization, Pruning, Feature Engineering, Hyperparameter Tuning, Distributed-GPU Training, Machine Learning, Deep Learning, Computer Vision, Data Analysis, Data Visualization, Data Science, AutoML, CI/CD Pipelines, NLP, LLM