

# Sarthak Singh

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## EDUCATION

### Stony Brook University

*Master of Science in Computer Science*

### NMIMS MPSTME

*Bachelor of Technology in Computer Engineering, GPA: 3.6/4.0*

Stony Brook, NY

Aug. 2024 – May 2026

Mumbai, India

Aug. 2020 – May 2024

## EXPERIENCE

### Cloud Computing Intern

May 2023 – Aug. 2023

*Vodafone Idea Ltd.*

*Mumbai, India*

- Developed cloud-native applications using Docker and AWS, reducing operational costs by 15% through automated resource management and containerization
- Engineered backend migration of 12+ applications to cloud platforms, achieving 20% reduction in system downtime with zero data loss
- Built automated scaling solutions and monitoring dashboards, improving system efficiency by 25% and resource allocation by 18%
- Accelerated deployment cycles by 30% implementing CI/CD pipelines using Jenkins and microservices architecture

### Machine Learning Engineering Intern

Dec. 2023 – May 2024

*NMIMS University*

*Mumbai, India*

- Engineered full-stack recommendation engine using ConvLSTM and CNN models, achieving 89% detection accuracy with Python, TensorFlow, and OpenCV
- Scaled application to handle 10,000+ user requests, improving engagement by 18% and satisfaction by 25% through optimized ML pipelines
- Implemented A/B testing framework across 500+ users to validate feature performance and model accuracy improvements

## PROJECTS

### 3D Neural Rendering Engine (NeRF) | *Python, JAX, TensorFlow, CUDA*

Jan. 2024 – May 2024

- Developed GPU-accelerated rendering engine with 3,000+ lines of Python code, implementing volumetric ray tracing algorithms achieving 25-30 dB PSNR
- Architected 3D reconstruction pipeline with Poisson surface reconstruction supporting 5 file formats, optimizing rendering performance by 40%
- Implemented camera calibration system processing 100+ images with 95% pose estimation accuracy using computer vision algorithms

### Distributed Banking System with Consensus Protocol | *Python, gRPC, Docker, Redis*

Sep. 2023 – Dec. 2023

- Architected distributed banking application with Linear-PBFT consensus protocol ensuring Byzantine fault tolerance across 10+ nodes, achieving 99.9% uptime and 1,000+ TPS
- Optimized backend performance improving transaction throughput by 22% and reducing latency from 500ms to 320ms through asynchronous processing
- Built monitoring and logging infrastructure enabling automatic failover with 2-second recovery time and full ACID transaction guarantees

### Agent-Based MLOps Platform | *Python, Streamlit, XGBoost, SHAP, LIME, PyDantic*

Oct. 2024 – Dec. 2024

- Designed autonomous ML pipeline with 5 specialized agents coordinating via JSON messaging protocol, executing 50+ hyperparameter trials across Random Forest and XGBoost models achieving 92% classification accuracy on healthcare datasets
- Integrated SHAP and LIME explainability frameworks generating 100% model interpretability scores with fairness validation reducing bias by 15% across 3 protected attributes in finance and healthcare domains
- Deployed Streamlit web interface processing 20+ datasets with drag-and-drop uploads, reducing pipeline setup time by 60% through interactive visualization and comprehensive audit logging tracking 500+ agent decisions

## PUBLICATIONS

**Movie Recommendation Using Voice Analysis** – AIP Conference Proceedings, 2024 (DOI: 10.1063/5.0234460)

**Music Recommendation Using Facial Emotion Recognition** – Book Chapter, 2024 (ISBN: 978-93-91535-66-7)

## TECHNICAL SKILLS

**Languages:** Python, C++, Go, SQL, R, JavaScript, HTML/CSS, Bash/Shell Scripting

**ML/DL Frameworks:** PyTorch, TensorFlow, Keras, JAX, Hugging Face Transformers, scikit-learn, XGBoost, LightGBM

**LLM & Gen AI:** LangChain, LlamaIndex, OpenAI API, RAG, Fine-tuning (LoRA/QLoRA), Prompt Engineering, Vector Databases (FAISS, Pinecone, ChromaDB)

**Computer Vision & NLP:** OpenCV, YOLO, ResNet, ViT, BERT, GPT, LSTM, Transformers, spaCy, NLTK, Librosa

**MLOps & Development:** Docker, Kubernetes, Git, Jenkins, MLflow, Weights & Biases, DVC, Airflow, FastAPI, Flask, Streamlit, React, Node.js

**Cloud & Databases:** AWS, GCP, PostgreSQL, MongoDB, Redis, Spark, pandas, NumPy

**Software Engineering:** REST APIs, Microservices, CI/CD Pipelines, System Design, Distributed Systems, Algorithms, Data Structures