# Sanyam Raina

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## Education

**University of Southern California** — Los Angeles, California, USA
*Master of Science in Computer Science* — **Dec 2025**
*Coursework: Analysis of Algorithms, Artificial Intelligence, Machine Learning, Applied NLP*

**Pandit Deendayal Energy University** — Gujarat, India
*Bachelor of Technology in Computer Engineering* — **Jun 2022**
*Coursework: Big Data Analytics, Operating Systems, Computer Vision, Web Technology*

## Technical Skills

**Languages & Scripting:** C++, C, Python, JavaScript, TypeScript, HTML5, CSS, Swift
**Frameworks & Libraries:** React.js, Redux, Node.js, Express.js, Django, Flask, Scikit-learn
**Databases & Cloud Technologies:** SQL, PostgreSQL, MongoDB, AWS (EC2, S3, EBS, RDS)
**Development Tools & Platforms:** Git, Docker, REST, GraphQL, Model Context Protocol (MCP)

## Work Experience

**GenAI Intern – NEXED, Remote** — **Jun 2025 – Dec 2025**
- Worked on scalable face swapping and collaborative video creation systems, deploying a Flask based web app with multi user real time collaboration, queue backed worker execution, and distributed video processing across AWS EC2, S3, and EBS.
- Built production grade infrastructure and tooling including autoscaling ready AWS architecture, persistent storage flows, video normalization pipelines, job retry logic, and comprehensive logging and monitoring for worker health and task states.
- Designed and deployed a multi threaded multi worker face swapping pipeline using IoU and distance based tracking with parallel FFmpeg operations which reduced latency by 55% and lowered failure rates by 40% under concurrent user load.

**Software Development Intern – Liberty Shoes, Gurgaon, India** — **Apr 2023 – Dec 2023**
- Spearheaded analysis efforts that identified critical features and engineered scalable data pipelines, boosting model accuracy by 15% and resilience by 25% across three major product lines, driving over 200K in annual cost savings.
- Designed and deployed a scalable sales forecasting system using Python and TensorFlow for 30+ products, improving projection precision, enabling 20% faster decisions, and reducing inventory holding costs by 12% across cross-functional teams.
- Automated monthly model evaluations with Jenkins, enhancing feature engineering and tuning to reduce forecasting error by 30%.

## Projects

**Othello Game Platform** | *Python (FastAPI), React, PostgreSQL, C++)*
- Designed and built a full-stack Othello game with a FastAPI backend, React frontend, and PostgreSQL-powered move database, featuring real-time gameplay, advanced move history, persistent game state, and increasing move retrieval speed by 80%.
- Implemented a multi-level AI opponent using minimax with alpha-beta pruning, dynamic search depth, and opening randomness, achieving sub-500ms response times and 80-90% search space reduction.
- Built a production-ready move tree system with unit-tested logic for reliable and extensible game state management.

**Stock Information and Portfolio Management Platform** | *React, Node.js, MongoDB, Swift*
- Designed and developed a scalable, real-time stock trading platform serving 1,200+ active users by building a secure cross-platform React and Swift frontend with live price feeds, portfolio analytics, and responsive dashboards, enabling reliable trade execution across web and iOS.
- Deployed the platform with secure JWT-based authentication, role-based access control, and HTTPS, alongside persistent storage and real time monitoring, sustaining 2,500 requests/min while ensuring system resilience and data integrity.

**MyWorkout** | *SwiftUI, Swift Charts, Local JSON, MVVM*
- Designed and built an iOS fitness app using a fully on-device architecture to deliver privacy first, latency free workout logging, supporting reusable workout templates and a curated exercise library of 100+ exercises while eliminating network and synchronization failure paths.
- Implemented a modular app architecture using JSON-based persistence in Application Support and MVVM state management with ObservableObjects, providing a clean foundation for future sync and data export features.

## Research Publications

**Automatic Subjective Answer Evaluator using BERT** — **Jul 2023**
- Designed a BERT-based subjective answer evaluation system, achieving 90% accuracy compared to manual grading by combining TF-IDF keyword scoring with contextual analysis. Published in Networks and Systems, vol.703, Springer
- Architected a hybrid NLP algorithm integrating TF-IDF and BERT embeddings, enabling automated grading of descriptive answers with relative scoring and semantic relevance matching. [Paper]

**SafeShop** — **Jul 2022**
- Developed a real-time face mask detection system using SSD ResNet-50 with 94.67% accuracy. Integrated a GPS tracking for enforcing social distancing in retail spaces. Published in Neural Networks, Machine Learning, & Image Processing by CRC Press.
- Enhanced user safety by developing an Android application used for contactless ordering, real-time pickup coordination, and dynamic distance alerts using location-based visualizations. [Paper]