Charan Kumar

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Education

University of Southern California Los Angeles, CA, USA
Master of Science in Computer Science - Artificial Intelligence ***Aug 2024 – May 2026***
- **Relevant Coursework**: Foundations of AI, Machine Learning, Computer Vision, Neural Networks, NLP

SRM Institute of Science and Technology Chennai, TN, India
Bachelor of Technology in CSE with Specialization in AI and ML ***Sept 2020 – June 2024***
- **Relevant Coursework**: AI, Neural Networks, Computer Vision, Applied ML, Statistical ML, NLP, Database, Data Structures

Technical Skills

Computer Vision: OpenCV, Image Segmentation, Feature Extraction, Pattern Recognition
Deep Learning: PyTorch, TensorFlow, Neural Networks, Transfer Learning
Programming: Python (Strong), C++, JSON, pandas, NumPy
ML Techniques: Statistical Analysis, Data Visualization, Synthetic Data Generation, Semi-Supervised Learning

Experience

AI Intern Apr 2024 – June 2024
CoEZET IIT Madras *Chennai, TN, India*
- **Developed a full-stack lab reservation application** with integrated **LLM-powered recommendation system** for **500+** users, demonstrating ability to build end-to-end intelligent systems for real-world applications
- **Implemented real-time decision algorithms** that optimized resource utilization and efficiency by **75%**, showcasing expertise in designing autonomous systems for complex environments
- **Led end-to-end implementation** including **model fine-tuning**, stakeholder requirements, and cross-functional testing; achieving **98%** adoption rate with minimal training, demonstrating practical application of AI systems

Deep Learning Academic Intern July 2023
NUS Advanced Computing for Executives *Singapore*
- **Led a team of 3** to design and implement a **neural network-based letter recognition system** for children's education, achieving **93% accuracy** and positive engagement from over **100 students**
- Implemented **pattern recognition algorithms** and optimized training datasets to enhance model performance for recognizing handwritten English alphabets, demonstrating expertise in image recognition applicable to medical imaging
- Deployed the solution using **AWS EC2 instances** and **Hadoop** for distributed data processing, designing a scalable cloud architecture for efficient model training and image analysis

Software Developer Intern Nov 2022 – Jan 2023
DSSI Solutions *Chennai, TN, India*
- Developed a high-performance **surveillance monitoring system** in **C++ using OpenCV** for real-time video analysis, reducing incident response times by **45%**, demonstrating expertise in **computer vision and real-time processing**
- Implemented **secure image processing pipeline** that handled **1000+** daily video transactions while maintaining robust feature extraction capabilities, showing ability to design reliable image analysis systems

Research Publications

Agent Decision-Making through Multimodal LLM-RAG Simulation Jan 2025 - Present
- Developing a **novel multimodal RAG system** that retrieves relevant visualizations based on textual descriptions, with techniques applicable to medical image analysis and feature extraction
- Implementing an experimental **simulation framework** generating multiple possible paths, reducing errors by **45%** compared to traditional approaches - concepts applicable to improving cell segmentation algorithms

A Novel Approach to Career Guidance System using Machine Learning and Blockchain June 2024
- Published in IEEE (ieeexplore.ieee.org/document/10560362), demonstrating expertise in applying ML algorithms to build practical decision-making systems
- Developed and validated a robust recommendation framework with secure data handling, showcasing ability to conduct research and implement solutions for real-world applications

Projects

DNA Sequence Classification using Deep Learning Models Jan 2025 - Feb 2025
- Implemented and compared multiple **neural network architectures** (CNN, RNN, hybrid) for DNA sequence classification using **PyTorch**, achieving **92% accuracy** in identifying promoter regions from genomic data
- Applied **GPU acceleration techniques** that reduced training time by **40%** and optimized model hyperparameters through systematic experimentation, skills applicable to enhancing histopathology image processing pipelines

Game playing AI agent- Little GO Nov 2024 - Jan 2025
- Developed a **high-performing AI agent** leveraging **Alpha-Beta pruning and NegaMax algorithms** with strategic decision-making capabilities that achieved **98% win rate** against advanced opponents
- Implemented **reinforcement learning techniques** for optimizing search patterns, demonstrating expertise in algorithm design that can be applied to complex image segmentation challenges