CHIRAG BHEEMAIAH PALANGANDA KARUMBAIAH

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EDUCATION

North Carolina State University, Raleigh, NC   **GPA - 4.0/4.0**
Master of Computer Science   **Aug 2023 - May 2025**

SSN College of Engineering, Anna University   **GPA - 9.16/10**
Bachelor of Information Technology   **Aug 2019 - May 2023**

Coursework: Distributed Systems, Operating Systems, Design & Analysis of Algorithms, Software for Robotics, Computer Networks, Real-time AI, Object Oriented Design and Development, Cloud Computing, Generative AI

SKILLS

Languages: Python, C++, C, Golang, JavaScript, TypeScript
Technologies: Docker, AWS, Kubernetes, Terraform, SQL, MongoDB, Tensorflow, PyTorch, Apache TVM ML Compiler, Robot Operating System (ROS), Numpy, Pandas, Sci-kit Learn, React, Flask, NodeJS, Git/GitHub, AWS, Kafka
Certifications: AWS Certified Cloud Practitioner

EXPERIENCE

FinSurge, Chennai, India - Machine Learning Engineer Intern (University-industry collaborative project)   **Aug 2022 - Feb 2023**
- Engineered a tool to automate the comparison of critical financial documents by developing a Flask-based RESTful API and a responsive React front-end. Integrated LSTM-based Optical Character Recognition (OCR) for precise text extraction, containerized with Docker, and deployed on AWS EC2 to ensure scalability and reliability.
- Boosted OCR performance across document layouts by 35% using GAN-based super resolution techniques and rigorous experimentation with OCR frameworks such PyTesseract, and PaddleOCR

PUBLICATIONS

AI-Driven Social Media Impact Assessment for Job Candidates - CEUR-WS Publication
- Designed a random forest based machine learning algorithm to objectively measure the impact of photographic profiles on job searches post-2021. Developed a scoring system for users' images with JSON-structured data, providing comprehensive feedback on the potential career impact of their online presence.

PROJECTS

AI-Powered Automated Test Case Generation — Large Language Models
- Built an automated test-suite generator with fine-tuned transformer models (CodeBERT, CodeT5, CodeLlama), applying chain-of-thought prompting and QLoRA quantization to cut model size by 75% and boost inference efficiency.
- Designed a RAG pipeline (Pinecone, LlamaIndex, LangChain) and integrated RLHF with developer feedback to deliver accurate, maintainable, and context-aware test generation.

Optimized License Plate Recognition (LPR) System - Machine Learning Compiler Optimization
- Implemented and optimized a state-of-the-art CNN-based LPRNet for real-time recognition in smart transportation, achieving 78% model compression through optimization techniques including post-training quantization, 2:4 structured pruning, JIT compilation for hardware acceleration, and machine learning compilation based optimizations such as vectorization, tiling, loop unrolling resulting in a 2.2× increase in inference speed on ONNX Runtime.

Distributed Security Threat Detection System — Distributed Systems
- Deployed a scalable, fault-tolerant, highly available distributed real-time security monitoring platform leveraging Python and Kubernetes harnessing nodes powered by self-supervised machine learning for anomaly detection based on system call traces in container environments. Integrated Kafka for resilient event streaming and implemented automated quarantine protocols and granular audit logging for rapid threat containment and comprehensive forensic analysis

CI/CD Pipeline for Autonomous Robotic Systems using GitHub Actions — DevOps
- Architected and deployed a robust CI/CD pipeline using GitHub Actions, implementing custom Docker containers and multi-stage workflows to automate testing and deployment of ROS-based autonomous systems
- Developed high-performance Python ROS nodes with publisher-subscribe architecture for headless simulations accelerating build executions integrating PyTest framework for comprehensive unit and integration testing to maintain correctness.

Maverick Ticketing System — Full Stack Development
- Architected a full-stack railway ticketing web application using React, Express, NodeJS and MySQL to implement robust CRUD functionality and develop responsive, cross-device user interfaces with Bootstrap. Validated system reliability through extensive unit and functional testing, orchestrating the application with Docker and Kubernetes for scalability and high availability.