RAKSHEKA RAJAKUMAR

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Summary: Machine Learning & Software Engineer adept at managing code lifecycles, streamlining workflows & collaborating with cross-functional teams. Excels in dynamic environments, effectively communicating ideas, adapting to feedback & building solutions

EDUCATION

University of Southern California — **Los Angeles, CA**
Master of Science in Electrical & Computer Engineering- Machine Learning & Data Science — August 2023-May 2025

- Courses: Machine Learning- Mathematical methods, Probability and Statistics, Data structures and algorithms, Temporal & Spatial data analytics, Information Retrieval, Cloud Computing, Deep learning systems, Digital signal processing

Anna University - Coimbatore Institute of Technology — **Coimbatore, India**
Bachelor of Engineering in Electronics and Communication – GPA: 9.1/10 — July 2019-May 2023

- Courses: Database management systems, Machine learning, Probability, Stochastic processes, Digital image processing

EXPERIENCE

WorkUp — **Los Angeles, CA**
Machine Learning Engineer — May 2024-July 2024

- Developed a two-tower retrieval model with NVIDIA Merlin for job matching in a state-of-the-art recommender system
- Optimized item-query towers leveraging encoder and MLP blocks on AWS SageMaker
- Improved embedding quality by 15% and prevented overfitting using different regularization techniques & negative sampling
- Enhanced database querying by indexing, automated checks and streamlined workflows to ensure high data quality

Kanini Software Solutions — **Chennai, India**
Full Stack Developer Intern — February 2023-June 2023

- Designed scalable web applications utilizing Python (FastAPI), React, Node.js, and PostgreSQL
- Implemented CI/CD and Kubernetes for efficient deployment, reliability, and optimal user experience
- Led a team of four to build banking application with ETL pipeline for real-time analytics & visualization, securing 70% traffic

MITACS — **Waterloo, Canada**
Machine learning Research Intern — June 2022-October 2022

- Researched Dynamic Key-Value Memory Networks (DKVMN) to model knowledge retention dynamics, capturing forgetting and relearning patterns to enhance AI proficiency assessment in educators and personalize curriculum
- Managed events and conducted seminars explaining a rover prototype, for a project sponsored by Canadian Space Agency
- Worked in a team (Under Dr. Julie Mueller and InkSmith Technologies) to program K8 rovers for object detection

TECHNICAL SKILLS

Languages: Python, C++, C#, SQL, HTML, CSS, JavaScript
Frameworks & MLOps: TensorFlow, Keras, PyTorch, Pyspark, Scikit Learn, NumPy, Matplotlib, ML Flow, Langchain, LlamaIndex, Hadoop
Web Technologies: React, Node, SpringBoot, FastAPI, Flask, Streamlit, MySQL, RDBMS, Postgres, MongoDB, LAMP, Selenium
Cloud & DevOps: Linux, AWS SageMaker, Data Lake, S3, Bedrock, Docker, Kubernetes, Kubeflow, Git, Jenkins, JIRA
Domains: Recommendation systems, Object segmentation, Computer Vision, Text processing, Cloud computing

PROJECTS

Federated Learning in 3D Brain-tumor segmentation | Python, Pytorch, ResUNet, TransUNet, UNet, MLOps

- Pioneered research on federated learning aggregation algorithms for multimodal 3D brain tumor segmentation, training ResUNet and Transformer-encoded UNet models to achieve performance comparable to centralized learning approaches

Wildfire Aftermath Analysis using Satellite Imagery | Erdas, Detectron2, Mask R-CNN, SQL, Python

- Built segmentation pipeline with Detectron2 & Mask R-CNN for wildfire damage assessment, using Hadoop for distributed storage
- Extracted RGB & NIR values (through a virtual electromagnetic shift) from satellite imagery via ERDAS to assess fire intensity

Empathy-Driven Conversational AI (LLMs) | Python, Hugging face, SpaCy, NLTK, TextBlob

- Customized an emotionally adaptive chatbot having custom state-of-mind class to analyze user conversation styles
- Ongoing: Customizing adaptation layer to guide users toward an optimal emotional state

AI Driven Interactive Systems | Deep learning, Computer Vision, Large language models

- Refined an AI-driven gesture recognition system, enabling real-time control with hand gestures (cursor, pen, navigations)
- Created a portfolio chatbot adopting LLaMa 2 & compared it to OpenAI GPT in terms of text generation quality and accuracy

Movie Recommendation systems | Python, Flask, SQL, Deep learning

- Architected a sophisticated movie recommender system using RBMs, outperforming traditional K-means clustering methods on IMDB data. An efficient flask-based web application for users to register and receive personalized movie recommendations

PUBLICATIONS AND CERTIFICATIONS

- Performance Analysis of CNN Architectures in Multi-label Image classification, Proceedings **IJCA** 184(48):14-18, February 2023
- Assessment of ML Algorithms for Predicting Campus Placements, Proceedings of **ICMCSI** 2023 (pp. 221-231 Springer)
- Amazon (AWS) certified AI Practitioner - https://www.credly.com/badges/df3a3caa-075c-4d53-a212-da49fe37a62a/public_url