Raksheka Rajakumar

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A versatile problem solver leveraging machine learning, cloud computing, and software development to tackle diverse challenges efficiently.

Education

University of Southern California **August 2023 - May 2025**
Master of science in Electrical and Computer Engineering- Machine Learning and Data Science
- **GPA: 3.44/4** ; Courses: Deep Learning systems, Reinforcement learning, Information retrieval and web search engines, Data structures

Anna University - Coimbatore Institute of Technology **July 2019 - May 2023**
Bachelor of Engineering in Electronics and Communication
- **GPA: 9.1/10** ; Courses: Machine Learning, Web Development, Data analysis and Networking

Experience

Machine Learning Engineer *Los Angeles, CA*
WorkUp **May 2024 - July 2024**
- Leveraged deep learning models to put together a SOTA recommender system for a TikTok-style application for employment using Nvidia Merlin for pipeline creation and AWS for Cloud deployment. Personal contribution: Candidate retrieval system and model development (Merlin with Two tower architecture)

Associate Trainee Intern *Chennai,India*
Kanini software solutions **February 2023 - June 2023**
- Developed and deployed web applications using React.js, Node.js, and .NET Framework; special focus: front end
- Managed databases using DBMS tools; worked on software deployment on AWS, utilizing C# for back end development

Machine Learning- Artificial Intelligence Intern(remote) *Ohio, USA*
MSAII **November 2022 - February 2023**
- Collaborated with a group to optimize GPU utilization to ensure 99% model up-time while reducing costs by almost 20%
- Optimized a Faster R-CNN model for customer emotion analysis, achieving 2-checkpoint reductions in error metrics.

Machine Learning Research intern *Waterloo, Canada*
Teach Digital Lab- MITACS **June 2022 - October 2022**
- Conducted predictive modeling to test digital fluency among Ontario's education professionals.
- Worked with a team under Dr. Julie Mueller, in partnership with InkSmith Technologies, on developing a rover prototype for K-12 education. The project was funded by the Canadian Space Agency.
- Researched on using R-CNN for object detection in space rovers.

Machine Learning Intern (remote) *Bengaluru, India*
Zebo.AI **October 2021 - January 2022**
- Pioneered development of advanced fraud detection models, leveraging anomaly detection and pattern recognition for financial transactions, reduced false positives, and improved precision by 17%

Skills

Programming Languages: Python, C++, C#, JavaScript, HTML, CSS, MATLAB

Frameworks and Libraries: PyTorch, TensorFlow, NumPy, Pandas, Matplotlib, Scikit-learn, Selenium, React.js, Node.js, Bootstrap, Tailwind

LLMs: LLaMa2, BERT, OpenAI GPT, Cohere, RoBERTa

Databases: MySQL, SQL, MongoDB

Tools: Docker, Kubernetes, AWS, GitHub, Hypervisors, Visual Studio, VSCode, Atom, XCode, Jupyter Notebook, Google Colab, Hadoop, Spark, ML Flow

Domains: Deep Learning, Computer Vision, Natural Language Processing, Generative AI, Cloud Computing, Web Development, Web Crawling

Languages Known: English, Tamil, Hindi, Telugu, Bahasa Indonesia

Projects

Federated Learning in 3D Brain-tumor segmentation
- Developed a federated learning model for 3D brain MRI segmentation using BraTS dataset, with a UNet architecture and FedPer to address client data variability by centralizing encoder and personalizing each client's decoder.
- Compared model performance with TransUnet, refining segmentation adaptability across client environments.

Wildfire Aftermath Analysis using Satellite Imagery
- Created a comprehensive object detection and segmentation pipeline to assess wildfire damage from satellite images. Extracted RGB and Near-Infrared (NIR) values (using virtual electromagnetic shift) from satellite imagery using ERDAS software. Formulated a dataset of 16,000 entries to quantify impact of wildfires across different regions. Leveraged Detectron2 and Mask R-CNN for object detection and segmentation, accurately identifying burnt areas. Applied the Burnt Index Ratio to assess fire damage intensity in wildfire-affected areas.

Optimization for Empathy-Driven Conversational AI (LLMs)
- Developed an emotionally adaptive chatbot with a custom state-of-mind class to analyze user conversation styles across formality, emotion, frustration, and rush. Ongoing: Using LLMs and an adaptation layer to guide users toward an optimal emotional state.

Movie recommender system
- Built a Movie Recommendation system using Restricted Boltzmann Machines for content-based filtering, compared with K-means.

Intelligent Sensory assistive glove
- Researched with a team to design a computer vision and IoT-based wearable glove system to detect and identify obstacles(types-32) via an ultra-sonic sensor, providing real-time speech output through optical character recognition to aid visually impaired people

Publications

Performance Analysis of CNN Architectures in Multi-label Image classification **February 2023**
International Journal of Computer Applications 184(48):14-18, February 2023

Assessment of Machine Learning Algorithms for Predicting Campus Placements **March 2023**
Mobile Computing and Sustainable Informatics: Proceedings of ICMCSI 2023 (pp. 221-231 Springer)