JAGADEESH KOVI

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AI/ML Research Engineer skilled in LLM pipelines, backend systems, regulatory NLP tools, and deploying cloud-based AI for public and private sectors. Proven at fine-tuning models on supercomputers, building scalable analytics workflows, and integrating AI in healthcare, finance, and civic domains. Proficient in Python, PyTorch, Docker, AWS, and advanced NLP, with a strong focus on system performance, inference accuracy, and real-time UX.

SKILLS

ML/AI/NLP: PyTorch, TensorFlow, Keras, Scikit-learn, LangChain, Hugging Face, NLTK, CNN, GAN, LLMs, Fine-tuning
Cloud & Dev Tools: AWS (SageMaker, Lambda, EC2, RDS), Azure (ML, DevOps, Kubernetes), Terraform, Git, Docker, Jenkins, CI/CD, Tableau
Programming/Database: Python, MySQL, PostgreSQL, MongoDB, JavaScript (React, Angular), Gen AI (MongoDB, Pinecone, Neo4j)

PROFESSIONAL EXPERIENCE

Data Scientist | Project 990 Sep 2024 - Present
- Architected scalable backend and streamlined SQL queries for processing over 12M tax records, enhancing access to real-time philanthropic insights.
- Leveraged Indiana University's Big Red 200 supercomputer to fine-tune NLP models for classifying nonprofit mission statements.
- Engineered AI chatbots using advanced NLP to provide information access to philanthropic foundations, enhancing stakeholder engagement.

AI Engineer (Linguistic Research) | Indiana University- PBS Sep 2024 - Apr 2025
- Built GPT-4o-based speech transformer to reconstruct aphasic input into coherent sentences, preserving meaning and ensuring linguistic correctness.
- Created a correction pipeline with SentenceTransformers, embedding 100+ hours of speech data to enhance AI response to linguistic impairments.
- Used Whisper for STT and pyttsx3 for TTS, enabling multimodal AI voice interaction in speech therapy apps for continuous patient engagement.
- Designed a real-time feedback system where patients refine AI-generated speech, improving correction accuracy using a reinforcement mechanism.
- Devised an AI error detection module to classify deficits like neologisms and adapt correction strategies dynamically in real-time contexts.
- Fine-tuned LLMs with LoRA/PEFT, improving domain-specific performance and aligning responses with neurorehabilitation speech correction goals.

Data Analyst (ML & NLP) | Indiana University - Kelley School of Business May 2024 - Aug 2024
- Developed an NLP-based risk visualization tool, reducing manual review time by 50% and enhancing compliance tracking across multiple industries.
- Engineered an ETL pipeline using Python, AWS Lambda, and RDS, automating data collection from 10+ enforcement sources for enhanced analysis.
- Launched a real-time dashboard with AWS EC2 and CloudWatch, providing scalable, monitored insights into regulatory trends and industry compliance.

Software Engineer | FIS Global Oct 2021 - Nov 2022
- Refined data pipelines for 30+ banking modules via SQL & Apache Kafka, boosting real-time accuracy to 99% & processing 1M+ daily transactions.
- Deployed interactive Tableau dashboards, reducing data access time by 60%, enabling faster data-driven decisions across multiple cross-functional teams.
- Applied Python (Pandas, NumPy) and SQL for ETL and aggregation, improving system performance and reducing query resolution time by 45%.
- Integrated automated data validation in CI/CD pipelines with Jenkins and PyTest, reducing deployment time by 50% and minimizing data discrepancies.

Machine Learning Intern | Bennett University Sep 2021 - July 2022
- Pruned 40-50% of CNN parameters, halving model size and doubling inference speed on edge devices without compromising robustness.
- Built a custom K-means algorithm to assess feature importance, halving redundant computations and improving training efficiency in DL workflows.
- Reduced 30% FLOPs on CIFAR-100 using VGG-16, preserved accuracy (±0.5%), and improved computational efficiency with 35% latency drop on edge devices.

PROJECTS

The On-Line Encyclopedia of Integer Sequences (OEIS) Project | *Sequence Analysis, Neo4j, LLMs*
- Developed a Neo4j graph database from OEIS .seq files to model and analyze relationships between sequences, authors, and citations. Leveraged LLMs and RAG architectures to extract metadata and automate sequence categorization, enabling advanced insight discovery.

Weather Data GCP Pipeline | *ETL, GCP Cloud Storage/Functions/Scheduler, BigQuery, Looker Studio*
- Designed and implemented an automated ETL pipeline on Google Cloud Platform for weather data management. Utilized Python, Pandas, and OpenWeather API for data extraction, transformation, and storage in BigQuery. Deployed and scheduled daily data processing using GCP services like Cloud Functions and Cloud Scheduler. Created interactive data visualizations and dashboards using Looker Studio for weather data analysis.

Object Recognition on Historic IULMIA Ad Videos | *Grounding DINO + SAM, open-set object detection*
- Enhanced IU Libraries Moving Image Archive accessibility by leveraging DINO+SAM architecture and YOLOv8 models for object detection and text recognition in historic television ads. Improved historical footage object detection by 20% through unsupervised learning on labeled datasets from video frames, with room for enhancement via OCR and optimized open-set object detection class selection.

Home Credit Default Risk Analysis | *Python, scikit-learn, TensorFlow, Feature Selection, Hyperparameter tuning*
- Architectured and optimized a deep learning model (MLP) using backpropagation, achieving 68.26% test accuracy and improving Home Credit's lending strategy. Enhanced performance through feature selection, hyperparameter tuning, and ensemble methods (RF, CatBoost, XGBoost), boosting predictive accuracy by 10%.

EDUCATION

Indiana University Bloomington | Master of Science - Data Science, GPA: 3.74/4.0 Aug 2023 - May 2025
- **Research Interests:** NLP, AI Agents, LLMs, Data Analysis, Applied Machine Learning, Reinforcement Learning

Siddharth Institute of Engineering & Technology | Bachelor's in Computer Science, CGPA: 8.8/10.0 July 2017 - June 2021
- **Publication:** Detection of Online Toxic Comments Using Deep Learning