Akshath Raghav Ravikiran

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Education

Purdue University West Lafayette, IN || August 2022 – May 2026
Bachelor of Science in Computer Engineering *GPA: 3.97*
Activities: ML@Purdue (Officer), Purdue E-Lab (Researcher), Bechtel Purdue (IoT Network, Software Lead), Cohere for AI

Technical Reports

Time-Driven Fire Risk Forecasting: Leveraging Historical Trends for Enhanced Seasonal Modeling
(**Ravikiran**, *Jain, et al.*) Report on deployed systems achieving 90%+ accuracies; validations against government forecasts.

Experience

TensorFlow Model Developer August 2023 – Present
Google ML X Purdue Duality Lab (Prof. James Davis, Purdue-ECE) *West Lafayette, IN*
- Re-engineering the state-of-the-art **MaskFormer** deep-learning model, focused on panoptic segmentation, to publish into Google's **TensorFlow Model Garden** for codebase re-use by users globally, alongside optimal pre-trained weights.
- Conducted experiments on GPUs & TPUs to ensure layer precision across the meta-architecture and implemented functions to ensure data consistency through the dataloader. Working on the evaluation module, including the implementation of the Panoptic Quality (PQ) metric for accurate model assessment.

Data Science Intern March 2023 – July 2023
Ambee (Climate Intelligence) *Bangalore, India*
- Individually built a global forest-fire forecasting system, integrated into Ambee's proprietary **API** dashboard, to mitigate disasters that cost the world economy $800+ billion. Developed modularized components implemented within an end-to-end **AWS** lifecycle ensuring tri-monthly forecast generation, complimented by robust **ETL pipelines**.
- Co-authored a white paper outlining unique strategies targeting historical Fire Weather Index, enhancing a **Boosted Multi-Target RF Regressor's** performance to surpass government forecasts (NIFC & CWFIS) in risk classification.

Data Science Lead December 2022 – April 2023
Lightning Wildfire Lab (Prof. Yuan Wang, Purdue-EAPS X NASA) *West Lafayette, IN*
- Supervised codebase development for short-term wildfire forecasting; Responsible for bundling netCDF data on the basis of spatio-temporal features to package into **LSTM**, **CNN** and **ConvLSTM** deep learning models.
- Automated API requests for large scale fire data collection from USGS and Copernicus; Developed scripts using **Xarray**, **GeoPandas** and **netCDF4** to process Landsat and GeoTIFF data from NASA/NOAA satellites.

Projects

AutoRecruit - HackHarvard '23 *Django, Modal, ElevenLabs, Deepgram, OpenCV2*
- Implemented a context-mapped knowledge-graph using **NLP** to help an LLM dynamically generate interview questions and evaluate applicants while considering real-time context, simulating a human-centric interview experience for users.
- Fine-tuned an MLP for audio analysis and integrated **DeepFace** for emotion detection, deploying these through Modal. Integrated React and Django using WebSockets for real-time speech transcription with **Deepgram** and used **ElevenLabs** for streaming text responses.

Amazon OpenSearch Service (Benchmark) *Jinja2, OpenSearchBenchmark, AWS EC2, Docker*
- Reworked the workload generation process within the **official macrobenchmarking framework**, enabling custom features for user-defined workloads. **Defined** documentation for creating performance benchmarks on hosted indices.
- Enhanced extraction efficiency by deploying **multi-process** capabilities for simultaneous data retrieval from clusters, ensuring optimal **throughput** and accelerated performance.

genCollab - CalHacks '23 *Flask, Discord, OpenAI, Redis*
- Built genCollab to wrap around **Discord** for AI-assisted project collaboration, enabling automatic roadmap development and role-based task allocation, specifically for use within open-source servers to evolve community development.
- Engineered a end-to-end **RAG** pipeline on **Redis**-scraped data to ensure that GPT-4 generates code that's integratable into an evolving codebase; utilized a hierarchical memory system to enhance context gathering using tree-traversal.

Technical Skills

Languages: Python, C, Java, JavaScript, MATLAB, R
Frameworks: TensorFlow, PyTorch, Keras, Xarray, GeoPandas, OpenCV2, GDAL, ONNX, Django, Node.js
Tools: Docker, DVC, Azure OpenAI, Google Cloud Platform, AWS (S3, SageMaker), PostgreSQL, Redis, Elastic