Akshath Raghav Ravikiran

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Education

Purdue University **West Lafayette, IN || August 2022 – December 2025**

Bachelor of Science in Computer Engineering *GPA: 3.81*

Honors: Eli Shay Electrical Engineering Scholarship (F'23 - S'24), Dean's List and Semester Honors (F'22 - S'24)

Research Papers

Time-Driven Fire Risk Forecasting: Leveraging Historical Trends for Enhanced Seasonal Modeling

(*Jain, **Ravikiran**, et al.)* Outlined architecture for fire-risk-forecasting system achieving 90%+ accuracies vs. govt. forecasts.

Experience

TensorFlow Model Developer **August 2023 – Present**

Google X Purdue Duality Lab (Prof. James Davis, Purdue-ECE) *West Lafayette, IN*

- Re-engineered the **MaskFormer** segmentation model to publish into the **TensorFlow (TF) Model Garden**. Conducted experiments on GPUs & TPUs to ensure layer precision; wrote unit and differential tests for validation.
- Engineered the **inference module**, including the PQ metrics implementation to work with TF 2.x's task flow. Integrated code for auxillary losses to address **inability of loss convergence**, and fixed run-time issues across computes.

Data Science Intern **March 2023 – July 2023**

Ambee (Climate Intelligence) *Bangalore, India*

- Built a global forest-fire forecasting system, from prototype to production, that remains integrated into Ambee's proprietary **API** dashboard. Developed modularized components implemented within an end-to-end **AWS** lifecycle (Spark, Glue, S3) ensuring tri-monthly forecast generation, complimented by robust **ETL pipelines** (Docker).
- 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

GrammarFlow *February 2024 - April 2024*

- Published a package to **ensure parseability** of LLM outputs into structured dataclasses, improving robustness of AI agents. Designed to address issues with LangChain on local LMs, GrammarFlow achieves parsing success of **99%+** across fine-tuned variants from **Llama, Mistral and Dolphin** on popular reasoning datasets.
- Introduced **GNBF grammar** generation to interface with efficient token sampling, incorporating regex patterns into decoding algorithms. Enables **complex use-cases**, including multi-grammar and nested sequence generation.

Reproducible AI Software (RAIS) *January 2024 - May 2024*

- Awarded **"Outstanding Sophomore in VIP"** for directing efforts to practically evaluate AI/ML research reproducibility. **Categorized** reproducibility types and **quantified** reusability with a scoring system.
- Scrutinized SWE literature to identify trends and implemented scrapers to analyze over 3000 academic & corporate research projects for validating my data-driven pipeline. Employed LLM chains integrated within repository file structures to assess structural cohesion, documentation, community engagement, and dataset accessibility.

Amazon OpenSearch Service *September 2023 - December 2023*

- 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 (upto 41.65%) by deploying **multi-process** capabilities for simultaneous data retrieval from clusters, ensuring optimal **throughput** and accelerated performance.

Technical Skills

Languages: Python, C, Java, JavaScript, MATLAB, R, PostgreSQL
Frameworks: TensorFlow, PyTorch, Keras, Xarray, Matplotlib, GeoPandas, OpenCV2, ONNX, Django, Node.js
Tools: Linux, Docker, DVC, MLFlow, ZenML, Azure OpenAI, Redis, Elasticsearch, DynamoDB
Cloud Utilities: Google Cloud Console (Compute), Amazon Web Services (ECS, S3, Lambda, Glue, Spark, Athena)