Han "Grace" Liu

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Summary

Machine Learning Engineer with 5+ years of experience developing machine learning models across computer vision, geospatial analysis, large language models (LLMs), and multi-modal data. Skilled in transformer architectures, research-to-prototype workflows, and building scalable pipelines. Experienced collaborating cross-functionally to translate research into usable ML tools and systems.

Experience

The Climate Corporation San Francisco, CA

Senior Data Scientist - Deep Learning *Jun. 2022 – Present*

- Developed a **Transformer-based model** for **seed recommendation** using **multi-modal data**, imagery, time-series, and scalar inputs.
- Developed a **Physics-Informed Neural Networks (PINNs)** model for **seed density recommendation**, improving prediction accuracy by **11%**.
- Built an **LLM-powered Virtual Assistant** prototype leveraging **Retrieval-Augmented Generation (RAG)** to enhance **customer decision-making**, improving user experience and reducing manual support workload.

Machine Learning Engineer *Sep. 2020 – Jun. 2022*

- Developed a **package** for building **scalable ML data pipelines**, supporting **structured and unstructured data** with **Spark, AWS S3, and CSW**, reducing development time from **6 months to 2 weeks**.

Ag Data Insights and Discovery Intern *Jun. 2019 – Sep. 2019*

- Developed a linear model for sugarcane yield forecasting using satellite imagery, achieving **93% accuracy** and **RMSE of 3.36 t/ac**, within reported industry benchmarks (0.61–10.78).

University of California, Davis Davis, CA

Research Assistant *Sep. 2015 – Sep. 2020*

- Developed **ML models** for forage production mapping, integrating sUAS and satellite data.
- Built **data fusion pipelines** and applied spatiotemporal analysis to assess climate change impacts on vegetation.
- Conducted land cover change detection in rangelands using **Random Forest classification** and geospatial datasets.
- Optimized ML workflows in **Python (NumPy, Pandas, scikit-learn)** and leveraged **GIS tools (Google Earth Engine, QGIS)** for large-scale geospatial analysis.

Technical Skills

Programming: Python, SQL
Modeling: Transformers, Neural Networks, CV, Multi-modal DL, PINNs, LLMs, Regression, Classification
Libraries & Frameworks: Scikit-learn, TensorFlow, PyTorch, Hugging Face, PySpark, NumPy, Pandas
Cloud & Deployment: AWS, GCP, Docker

Education

University of California, Davis Davis, CA, US

PhD. in Geographic Information Sciences *Sep. 2015 – Sep. 2020*

Nanjing University Nanjing, China

Bachelor of Science in Geographic Information Sciences *Sep. 2011 – Jun. 2015*

National Central University Zhongli, Taiwai

Bachelor of Science in Geographic Information Sciences *Feb. 2014 – Jun. 2014*

Publications

Liu, H., *et al.* (2022). *Regional differences in the response of California's rangeland production to climate and future projection.* **Environmental Research Letters**, 18(1), 014011.

Liu, H., *et al.* (2019). *Estimating Rangeland Forage Production Using Remote Sensing Data from a Small Unmanned Aerial System (sUAS) and PlanetScope Satellite.* **Remote Sensing**, 11(5), 595.

Co-authored **10+ additional papers** on geospatial modeling and environmental science in peer-reviewed journals.