

Adnan Dehghani

Houston, TX | adnand@rice.edu | [LinkedIn](#) | [GitHub](#) | [Google Scholar](#)

Summary

PhD student at Rice building physics-informed machine learning for continental-scale simulation, with two years of industry experience shipping LLM and geospatial ML products at Aboitiz Data Innovation. Fine-tuned LLMs with LoRA and led the team behind a deployed ChatGPT-based internal product.

Education

Rice University, PhD in Earth, Environmental and Planetary Sciences – Houston, TX Aug 2024 - May 2028

- GPA: 4.0/4.0

Iran University of Science and Technology, MS in Mechanical Engineering – Tehran, Iran Aug 2017 - Nov 2020

Isfahan University of Technology, BS in Mechanical Engineering – Isfahan, Iran Aug 2013 - July 2017

Experience

Graduate Research Assistant, Rice University – Houston, TX Sept 2024 - present

- Built a stochastic data-assimilation framework using operator flow matching and Fourier neural operators to predict river depth with quantified predictive uncertainty.
- Secured \$64,500 across four competitive research awards: the Mills-Bennett Fellowship, the USGS-funded TWRI Graduate Student Research Program, a CUAHSI Hydroinformatics Fellowship, and an E4 Cooper Seed Grant.

Research Data Scientist, Aboitiz Data Innovation / UnionBank of the Philippines – Singapore Sept 2022 - Sept 2024

- Fine-tuned Gemma with LoRA and built a retrieval-augmented generation pipeline over 5K+ pages of confidential financial documents for UnionBank's audit team, served on-premise via Ollama so data never left the bank; raised answer relevance by 54% in evaluation and enabled 70+ officers to review corporate loan applications.
- Led a team of 5 (three data scientists, a software engineer and an intern) building A-GPT, a personalised ChatGPT-based assistant.
- Built responsible-AI guidelines and toolkits for the organisation, named one of the Global Top 100 AI projects by UNESCO's IRCAI in 2022.

Research Assistant, University of Malaya, Hydrodata Lab – Kuala Lumpur, Malaysia Aug 2019 - Sept 2022

- Applied statistical analysis and deep learning to spatiotemporal environmental data across Peninsular Malaysia, Sabah, and Sarawak, drawing on 30 years of historical records to model potential future scenarios 80 years ahead.

Projects

Continental-Scale Hyper-Resolution River Routing (PhD research) – Rice University 2024 - present

- Built a physics-informed graph neural network for CONUS-scale river routing that runs 11x faster than the equivalent numerical solver, holding accuracy and water-balance error below 1%.
- Accelerated an MPI-parallel land-river simulation so a year of all of Texas runs in under half an hour on four nodes, removing 98.5% of routing substeps.

Skills

Programming: Python, SQL, C++, MATLAB, R

Machine Learning: PyTorch, LoRA, RAG, AI agents, transformers, natural language processing

Scientific Computing: high-performance computing, parallel processing, MPI, CUDA

Geospatial & Cloud: AWS, AWS SageMaker, GCP, Google Earth Engine