Hongtao Hao

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[PhD candidate in Computer Science with experiences in machine learning for healthcare, Bayesian modeling, large-scale HPC pipelines (9k+ distributed jobs), retrieval-based recommendation, and generative AI evaluation.]

EDUCATION

University of Wisconsin-Madison   Madison, WI
PhD in Computer Sciences   *Sept 2021 — Aug 2026*

WORKING EXPERIENCES

Robert Bosch LLC   Sunnyvale, CA
Research Intern (LLM)   *Jun 2023 — Aug 2023*
- Built an LLM-powered data analysis interface using Python, FastAPI, and Streamlit, incorporating prompt engineering.
- Developed a scalable evaluation pipeline for LLM outputs, contributing to two publications on LLM-human interaction.

YY Lab, Indiana University Bloomington   Bloomington, IN
Research Assistant (Full-time)   *Aug 2020 — May 2021*
- Automated dashboard updates with CI/CD; ranked among Top 10 Most Liked notebooks on Observable (2020). (Link)

PUBLICATIONS & PROJECTS

1st Author • **Bayesian Event-Based Models for Subtypes** *Machine Learning for Health Symposium 2025* (Link)
- Extended Event-Based Models to handle heterogeneous patient subgroups, improving performance by 27% over SOTA.

1st Author • **Joint Progression Model for Mixed Pathologies** *Machine Learning for Health Symposium 2025* (Link)
- Proposed a Bayesian ranking model for multi-pathology progression, boosting accuracy by 21% over a strong baseline.

1st Author • **Stage-Aware Event-Based Modeling (SA-EBM)** *Machine Learning for Healthcare (MLHC) 2025* (Link)
- Improved probabilistic models for healthcare progression prediction, achieving 40% accuracy gains over SOTA.

1st Author • **Thirty-Two Years of IEEE VIS: Authors, Fields of Study and Citations** *IEEE VIS, 2022* (Link)
- Analyzed three decades of IEEE VIS publications, demonstrating strong large-scale data processing and analysis skills.

4th Author • **Investigating Interaction Modes and User Agency in Human-LLM Collaboration for Domain-Specific Data Analysis** *CHI Extended Abstracts, 2024* (Link)
- Studied user agency and evaluation frameworks for domain-specific LLM collaboration.

3rd Author • **Can LLMs Infer Domain Knowledge from Code Exemplars?** *IUI Companion, 2024* (Link)
- Conducted a preliminary study on the ability of LLMs to extract domain-specific knowledge from code exemplars.

Maintainer • **LLM-Powered Movie Recommendation System** (Link)
- Engineered a retrieval-augmented generation (RAG) system using LangChain retrievers, vector stores (e.g., embeddings for similarity search), and LLMs for personalized movie recommendations.
- Deployed as a production web app on Vercel, enabling scalable real-time queries from users efficiently.

Maintainer • **Deep Learning for American Time Use Survey (ATUS)** (Link)
- Trained TensorFlow-based deep learning models to predict demographic time-use patterns from survey data.
- Deployed as an interactive web interface,, demonstrating skills in low-latency interactive predictions.

Maintainer • **pysaebm: Open-Source Python Package** (Link)
- Developed and maintain an open-source Python package for event-based modeling, demonstrating strong documentation & written communication skills, and showcasing experiences with transforming research into consumer-oriented products.

SKILLS

- Programming Languages: Python, JavaScript/TypeScript, HTML/CSS, Java, Bash, R, Julia, SQL
- ML: PyTorch, scikit-learn, Pandas, NumPy, Numba, LangChain, JAX
- Technologies: FastAPI, Next.js, React, D3.js, Svelte, Tailwind CSS, MongoDB, UNIX, Docker, Google Cloud Platform, Azure, CI/CD, HPC, LLMOps (evaluation pipelines, RAG)