OMKAR NAYAK

✉ omkarn@umich.edu in @omkar-nayak-n ⌗ @omin23

Education

University of Michigan   Ann Arbor, MI
Honors B.S in Computer Science and Mathematics, Minor in Ukrainian   *Graduation - May 2026*

- **GPA:** 3.4/4.00 | **Awards:** IDTech AI/ML Scholarship, 100% Scholarship @ KIS, Presidential Scholar
- **Courses:** Graduate Machine Learning, Graduate Probability Theory, Advanced Data Science, Introduction to Natural Language Processing, Computer Vision, Web Systems, Data Structures and Algorithms, Real Analysis
- **Activities:** Ukrainian Club (President), MSAIL (Researcher), Cantor Trading Club (Software Developer)

Experience

UMich Zhou Lab: Deep Learning for Precision Health   **University of Michigan**
Research Assistant   *Sep 2024 – Present*

- Authored a **computational biology** paper on developing **Large Language Models** using NLP to enhance phenotype recognition from doctor's notes, which advanced complex disease diagnosis through **Genome Wide Association Studies**, and presented analyses via a **full stack** engineered UI at Michigan Medicine
- Integrated **Retrieval Augmented Generation** with the **PubMed Central API** in the **backend** to reduce hallucinations and conducted **bias testing** using **statistics** and the **Learning Interpretability Tool** along with **Deepval** for fine-tuning and to **test infrastructure**, ensuring accurate data retrieval
- Implemented software using the **Agile** development on the HIPPA regulated **HPC cluster** using the **SLURM Workload Manager** and installed/complied bespoke software using system administration techniques in **Linux/Unix/Bash** while employing **information security** methods to protect sensitive data in **EHR research**

GRID (Suuchi Inc.)   **New Jersey**
Machine Learning Engineer Intern   *May 2024 – Nov 2024*

- Deployed **Predictive Modeling** using **Lightwood** and **Hugging face** models on **docker** to develop 5+ proprietary Machine Learning Models for product and sales **forecasting**, resulting in a 95% average AUROC score.
- Utilized **PostgreSQL**, **MindsDB**, and **Apache Superset** to analyze information using the internal database and integrated ML models into the company's SAAS **platform services** "Suuchi GRID", resulting in 27% increase in orders.

Research and Projects

Cell Foundation Model Benchmarking and Fine-Tuning
Python, SQl, PyTorch, MLflow, Docker

- Engineered a standardized **benchmarking** framework for scRNA-seq **foundational models** and devised optimized **fine-tuning** methodologies to enhance model performance across relevant evaluation metrics and several tasks
- Utilized **PyTorch** and TensorFlow for model evaluation and fine-tuning, **MLflow** for experiment tracking, and **Docker** to ensure environment reproducibility across all benchmarking exercises

Graphical Neural Networks for Epidemic Simulations
Python, PyTorch Geometric, SciPy

- Implemented algorithms leveraging **Graph Neural Networks** in **mathematical modeling** for **epidemiology** and presenting findings on Covid-19 spread in various cities at the Math Department Symposium with 50+ attendees
- Developed a novel method to simulate Covid-19 virus transmission dynamics using **PyTorch Geometric** and extended **PyTorch** libraries along with **SIRD Delayed Differential Equations.**

Ukrainian Refugee App
JavaScript, AWS

- Shipped an **end-to-end** web app that enabled Romanian volunteers at Garra de Nord Station to efficiently deliver critical humanitarian supplies to Ukrainian refugees using **JavaScript** for Front/Back-end and **AWS** for storage.
- Onboarded thousands of users, **prototyping** the MVP in just two weeks and deploying final product in < 1 month.

Skills

Languages: Python, C++, SQL, JavaScript, MATLAB
Frameworks and Libraries: PyTorch, Pytorch Geometric, SciPy, MLflow, React, Apache, SQLite, PostgreSQL
Developer Tools: Git, Github, AWS, Azure, Visual Studio Code, Docker, LPI, REST API, PubMed API, WSL, Figma

Interests

Basketball, One Piece, Oranges (or anything citrus), Fragrances, and Puzzles