

NIKHIL MANAKKAL

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EDUCATION

Lehigh University

Bethlehem, PA

B.S. Earth and Environmental Sciences & B.A. Computer Science Aug 2023 – May 2027

- **Academic Standing:** Overall GPA: 4.00
- **Core Coursework:** Machine Learning, Statistics, Algorithms, Data Structures, Software Engineering, System Software
- **Study Abroad:** IFSA Tech Career Accelerator (Prague, Spring 2026); Lehigh Launch (Quito, Fall 2023)

PROFESSIONAL EXPERIENCE

NOAA - National Weather Service

Silver Spring, MD

William M. Lapenta Intern

June 2026 – August 2026

- Developed Model Context Protocol (MCP) services connecting Large Language Models (LLMs) to Numerical Weather Prediction (NWP) data in NWS cloud APIs via Python middleware.
- Engineered a Next.js map dashboard utilizing spatial indexing and micro-batching to render complex weather overlays up to 100,000 grid cells.
- Architected an AI briefing studio integrating LLM takeaway generation and interactive Leaflet map to export 1080p NWP presentations for NBM/RRFS models.
- Presented work to 40+ NWS Office of Meteorological Development (OMD) staff and senior leadership on MCP integration; submitted project abstracts to the 8th NOAA AI Workshop and 2027 AMS Annual Meeting.

WhomLab

Prague, Czechia

Machine Learning Engineer

February 2026 – May 2026

- Co-developed TF-IDF NLP pipeline to predict Big Five (OCEAN) personality traits, with SHAP explainability, achieving 0.67 macro F1 on par with published neural-network baselines, securing INNO-SBM research grant.
- Drove experimental direction toward larger Reddit dataset, lifting macro F1 from 0.62 to 0.67 and accuracy from 55% to 69% compared to mid-point baseline.
- Evaluated NLP pipelines, such as TF-IDF, sentence embeddings, with logistic regression and linear SVM classifiers, using Python's Scikit-learn library and Optuna for hyperparameter tuning.

RESEARCH EXPERIENCE

Lehigh University

Bethlehem, PA

Undergraduate Research Assistant

July 2025 – December 2025

- Assisted with GIS visualizations in QGIS for HOV Alvin, and sample collection, including CTD casts, during shipboard field operations aboard 3-week R/V Atlantis research cruise.
- Conducted laboratory analyses to create environmental datasets for future scientific publications.

Lehigh University

Bethlehem, PA

Supervised Research Internship

August 2024 – December 2024

- Led coding initiative in R, synthesizing, cleaning, and performing statistical analysis on particulate matter (PM 2.5) data collected from PurpleAir sensor network, reducing time spent on manual analysis by over 80%.
- Visualized spatial patterns in wind direction and pollution levels through wind rose and pollution rose diagrams.

PROJECTS

Find Your Historical Twin

Spring 2026

Python, DeepFace, React, Tailwind, FastAPI, Docker

- Led 3-person team building a full-stack facial recognition app for the Museum of Prague that matches user selfies against 500+ historical portraits, scoring runner-up for best student project as assessed by museum staff.
- Architected Python backend using DeepFace to generate facial embeddings stored as vectors in PostgreSQL, enabling rapid nearest-neighbor similarity search.
- Containerized the stack with Docker and deployed to a VPS alongside a React/Vite + Tailwind frontend with in-browser face capture, serving the live demo.

TECHNICAL SKILLS

Languages Python, Java, JavaScript, C, C++, R, BASH, SH, SQL, Dart

Frameworks & Libraries Scikit-learn, Optuna, Pandas, NumPy, DPLYR, React, Flutter, Tailwind CSS

Tools & Systems Git, VS Code, Cursor, Claude Code CLI, OpenCode CLI, QGIS

Fieldwork & Lab CTD Deployment, Geologic Mapping, GIS Mapping, Sediment Cores, Petrographic Microscopy, Total Stations

AWARDS & PUBLICATIONS

2027 [Pending Approval] **AMS Annual Meeting** – Abstract for "Enabling LLM-based Analysis of Probabilistic Weather Forecasts".

2026 **8th NOAA AI Workshop** – Abstract for "Development of LLM-Based Chat Tools for Analysis Of Probabilistic Weather Forecasts".

2026 **INNO-SBM Research Grant** – Helped secure funding for NLP pipeline deployment at WhomLab totaling 15,000 CHF.

2023-2026 **Dean's List at Lehigh University** – Awarded for academic excellence.