ZAVIER KAMATH

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SKILLS

Data & Cloud: AWS (Bedrock, Athena, Lambda, Sagemaker), SQL, Scikit-Learn, Keras, Monte Carlo Methods, Vector Similarity, APIs
Programming & AI: Python (Pandas, Matplotlib), Agentic AI, Prompt Engineering, LangChain, Strands, C++, TypeScript, LLMs, Streamlit
Research & Technical: Bayesian Statistics, High-Performance Computing, Statistical Mechanics, Science Communication, LaTeX, Bash, Git

PROFESSIONAL EXPERIENCE

Huntington National Bank **May 2025 - Present**
AI Engineer Co-op (AI Center of Excellence) Columbus, OH

- Research and development to implement AI solutions across all aspects of banking for data science team
- Developed agentic AI loan application processor that autonomously pulls customer data, stores information in database, and uses LLM-driven methods to validate data to save underwriters 20 minutes per application processed and saves $400,000+ / year
    - Solutions built using: AI Engineering, Retrieval-Augmented Generation (RAG), OpenAI, LangChain, Agentic AI, Prompt Engineering, AWS (Athena, Bedrock), SQL, Git, Streamlit, Agile, Bash, Presentation to Executives
- Developing financial advisor chatbot feature for Huntington mobile app that automatically pulls customer transaction data, creates graphics, performs data analysis, gives sanctioned advice, and safely interfaces with user
    - Solutions built using: Agentic AI, Retrieval-Augmented Generation, Prompt Engineering, Multi-Agent-Systems, AWS (Athena, Bedrock), AI Safety, OpenAI, Claude, SQL, Strands, Presentation to Executives, Git, Streamlit, Agile, Bash

The Ohio State University Astronomy Department **Summer 2023 - Summer 2024**
Astrophysics Research Assistant Columbus, OH

- Research project under Prof. Annika Peter and Prof. Ivan Esteban to analyze Dark Matter models against observed data
- Advanced constraints on Warm Dark Matter particle mass to 4 keV/c^2 through Bayesian statistical analysis of Milky Way satellite galaxy data, doubling previous predictions and optimizing computational bottlenecks to obtain 100x runtime improvement
    - Solutions built using: Python (Pandas, Scipy, Vegas, Matplotlib), Dark Matter Research, Data Analysis, Data Visualization, Bayesian Statistics, Monte Carlo Integration, High-Performance Computing, Bash
- Authored research methods summary for upcoming publication with full GitHub reproducibility, and presented findings at poster session communicating complex statistical analysis to diverse academic audience
    - Solutions built using: Science Communication, Dark Matter Research, Data Visualization, GitHub, LaTeX, Research Writing

PROJECTS

AI Voice Agent (Entrepreneurial Project / Web App) **August 2025**

- AI Voice agent that takes pizza orders while interacting this customers via telephone call, can be applied to any customer support task
- Built seamlessly fast backend agentic system with tool calling and knowledge retrieval and frontend dashboard
- Solutions built using: Voice AI, Agentic AI, Retrieval-Augmented Generation, LLMs, TypeScript, Python, AI Coding Tools (Claude Code, Cursor), React, RESTful APIs, Deepgram, Twilio

Physics Grad Match (Entrepreneurial Project / Web App) - physicsgradmatch.com **June 2025 - Present**

- A commercial web application that matches physics PhD program applicants to professors
- Built database of professors and research interest and website for analyzing user's natural language input using LLM for keyword extraction and vector similarity search for matching
- Solutions built using: Supabase (PostgreSQL + pgvector and OAuth), AI Coding Tools (Claude Code, Cursor), TypeScript, OpenAI Embeddings and LLM model APIs, Web Scraping (Beautiful Soup, Crawl4AI), React, APIs, Vercel, Stripe, Vector Similarity

PCA Analysis of Quasar UV Spectra (Advanced Astronomy Data Science Class Project) **April 2025**

- Reproduced the characteristic inverse relationship between received Quasar light (flux) and distance (redshift) using Principal Component Analysis
- Reconstructed full quasar continuum spectra from red-side spectral weights to reproduce mean transmitted flux vs. redshift relation through dimensionality reduction of high-resolution UV data
- Implemented advanced spectroscopic analysis techniques using Python with astronomical data processing libraries
- Solutions built using: Principal Component Analysis (PCA), SDSS Data, Data Cleaning, Python (Pandas, Scipy, Pandas, Astropy)

Analysis of One-Dimensional Thermal Conductivity (Computational Physics Class Project) **March 2025**

- Confirmed 1D thermal conductivity behavior in space and time along a copper rod matches Modified Heat Equation predictions
- Performed statistical analysis and data analytics with Python and high-performance numerical computations with C++ (faster)
- Solutions built using: Python (Pandas), C++, Laboratory Instrumentation, Statistical Analysis, High-Performance Computing

Deming Regression Analysis of Tully-Fisher Relation (Advanced Astronomy Data Science Class Project) **March 2025**

- The relationship between galaxy luminosity and rotational speed predicts galaxy distance
- Extended the analysis to early/late-type spiral galaxies to get a more accurate distance indicator
- Performed novel Bayesian linear regression analysis accounting for X and Y uncertainties in galaxy velocity-luminosity data
- Solutions built using: Deming Regression (Bayesian), SPARC galaxy data, Bootstrapping, Python (Pandas, Numpy)

NFL Data Analysis (Big Data Science Class Project) **November 2024**

- Trained neural network and random forest models to analyze 50,000+ NFL plays and predict pivotal NFL plays with 75%+ precision
- Predicted fumble probability and identified key correlational features while classifying shotgun vs. non-shotgun formations
- Solutions built using: Python (Scikit-Learn, Keras, Pandas, Plotly, Numpy), Neural Network, Random Forest

EDUCATION

The Ohio State University **May 2025**
Bachelor of Science | Majors: Physics and Astronomy & Astrophysics | **Minor:** Spanish | **GPA:** 3.98/4.0 Columbus, OH
Coursework:

- Computational Physics, Astronomy Data Science, Big Data Analytics, Advanced Physics Lab, Quantum Mechanics, Electricity and Magnetism, Statistical Mechanics, Cosmology, Calculus 1-3, Differential Equations, Linear Algebra, Intermediate Spanish

Leadership

- **Gaming Club Team Captain:** Led competitive esports team with planning, practice, and mentorship of teammates

Honors and Awards

- **2025 Physics Senior Award –** Cash award for outstanding academic achievement among senior Physics majors
- **Summa Cum Laude -** Latin honors awarded by The Ohio State University for exceptional academic performance
- **2023 Physics Summer Undergraduate Research Scholarship -** For conducting cutting-edge physics research
- **Trustees Scholarship -** Merit-based scholarship awarded by The Ohio State University for academic excellence
- **Dean's List -** For all 8 semesters at The Ohio State University

Other Activities: Astronomical Society (Autumn 2023), Intermediate Spanish Proficiency, Advanced Laboratory Instrumentation