Dennis Farmer

Ann Arbor, Michigan
dennisfarmer.dev dennis-farmer dennis-farmer dennisfj@umich.edu

Education

University of Michigan - Ann Arbor, MI **2022 -**
B.S.E. Data Science - College of Engineering, Minor in Music
Coursework: Machine Learning, Computational Methods for Statistics and Data Science, Probability Theory, Theoretical Statistics, Data Structures and Algorithms

Projects

Music Recommender System **March 2025**
Personal Project *Ann Arbor, MI*

- Built an automatic playlist continuation model with a web interface, using web-scraped dataset of audio and user interaction (playlist) data (Beautiful Soup, scikit-learn, SQL, Streamlit, Plotly)
- Created API to extract audio embeddings with a convolutional neural network model trained on genre classification (Tensorflow, AWS Lambda, Docker)
- Utilized kernel principle component analysis on audio embeddings, as well as latent matrix factorization methods, for track recommendation via content-based and collaborative filtering respectively

Convolutional Neural Network for Image Classification **September 2023 – December 2023**
Michigan Data Science Team *Ann Arbor, MI*

- Designed and trained a convolutional neural network architecture to distinguish between AI-generated faces and real human faces with a team of five people (PyTorch)
- Developed a web application for uploading images and receiving classification results via API, with interpretability via GradCam convolutional layer visualizations (React, Express)

Research Experience

Computational Statistics - Roaming Behavior of Domestic Cats **October 2024 - December 2024**
Final Research Paper - Computational Methods for Statistics and Data Science *Ann Arbor, MI*

- Developed and validated a beta regression model using Monte Carlo simulations and bootstrapping to predict the proportion of time domestic cats spent away from their home (R)

Causal Discovery - Philosophy of Science **September 2022 – August 2023**
University of Michigan - Dr. Patrick Grim *Ann Arbor, MI*

- Conducted research on the use of structurally adaptive Bayesian networks to determine the causal structure of how scientific theories develop, given a stream of evidence over time
- Developed genetic algorithms for causal networks based on Judea Pearl's theory of causality, and ideas from causal discovery literature, to model causal structures of scientific theories (Python)

Teaching Experience

Data Science - Education Developer **June 2024 – Present**
Michigan Data Science Team *Ann Arbor, MI*

- Worked on improving the MDST educational experience for new club members by developing an introductory Python tutorial and hosting in-person office hours
- Created a new member onboarding challenge involving classification of Titanic passenger survival with neural networks (PyTorch)

Music - Educator and Composer **May 2023 – Present**
South Lyon East High School *South Lyon, MI*

- Educating keyboard percussionists 2-3 times per week during the fall and winter semesters
- Composing front ensemble music for the indoor percussion group South Lyon Percussion, which performs in competitions hosted by Michigan Alliance for Performing Arts

Skills

Languages C++, Python (PyTorch, scikit-learn, Pandas, Numpy, Beautiful Soup), R, SQL, Bash, Stan
Tools and Software: Git, Docker, Vim, Make, VSCode, GNU Debugger (gdb), Valgrind, Microsoft Excel