

Kayla Bollinger

☎ +1 (951) 526-7956

🏠 Madison, WI

✉ kaylabollinger@gmail.com

🌐 kaylabollinger.github.io

in linkedin.com/in/kaylabollinger/

🐙 github.com/kaylabollinger

EDUCATION

Carnegie Mellon University – Pittsburgh, PA

Ph.D., Applied Mathematics

May 2022

California State University Long Beach – Long Beach, CA

Post-Baccalaureate Coursework, Applied Mathematics

Aug 2015 – May 2017

B.S., Physics, *Summa Cum Laude*, *Robert D. Rhodes Award*

May 2015

SKILLS

Technical Skills

Python (pandas, NumPy, PyTorch, scikit-learn, Matplotlib, Plotly, NLTK, Beautiful Soup), Streamlit, Tableau, MS Excel, SQL

Machine Learning Skills

regression, regularization techniques, dimensionality reduction, neural networks

Certifications & Training

Google Data Analytics Professional Certificate (Coursera)

WORK EXPERIENCE

CMU Department of Mathematical Sciences

Graduate Researcher

Aug 2020 – May 2022

- Designed a regression/neural network based machine learning algorithm to learn a reduced order model whose interpretable structure led to a 20% decrease in error when compared to a standard neural network approach
- Experimentally demonstrated the robustness of this model in the data scarce setting (e.g., fewer than 100 data points) by comparing to a range of standard models; typically resulting in at least $2\times$ smaller error than the next best approach
- Developed a Python package to implement this model utilizing a combination of original code and several Python libraries such as PyTorch, scikit-learn, and NumPy
- Communicated the methods and results of this work by publishing and presenting “Reduced Order Modeling Using Shallow ReLU Networks” at the 2021 Conference on Mathematical and Scientific Machine Learning

Teaching Assistant for “Numerical Analysis”

Aug 2021 – Dec 2021, Aug 2020 – Dec 2020

- Led weekly computer lab sessions for ~40 students to facilitate their ability to apply theory from lecture to real world examples; received an average score of 4.73/5.00 for overall teaching effectiveness as evaluated by the students (compared to the 4.28 departmental average)
- Created 21 Jupyter Notebook based lessons which demonstrated how to use Python libraries such as NumPy and Matplotlib to effectively analyze and visualize data in clear and meaningful ways

PROJECT EXPERIENCE

🔗 **Portfolio of Projects:** kaylabollinger.github.io

🔗 Google Data Analytics Capstone Project

Nov 2022

- Cleaned and analyzed a year’s worth of bike-share data (approximately 5.7 million data points) using the pandas Python library and documented the process within a Jupyter Notebook
- Determined meaningful differences between casual and member users of the bike-share program and delivered recommendations on how a marketing team may best influence casual users to become members
- Designed an interactive dashboard in Tableau to effectively support and share the results of the analysis

🔗 Text Analysis: Power Creep in Hearthstone Cards

Jan 2023

- Web scraped ~23,000 pages containing highly rated deck data using the Beautiful Soup Python library, and pulled ~24,000 data points via an API defining every card in the Hearthstone game since its launch (about 10 years worth of data)
- Extracted meaningful information from text data using the NLTK natural language processing library in Python
- Deployed a web app using Streamlit containing several interactive Plotly charts to provide insights into the different ways in which power creep has affected the game over time