Kayla Bollinger

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Recent PhD graduate in applied mathematics with research experience in analyzing and visualizing data in a range of applications. Looking for an opportunity to grow professionally in a role where I can apply these skills to help guide insightful decisions.

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, Matplotlib, Plotly, scikit-learn), Tableau, Microsoft Excel, SQL
Machine Learning Skills	regression, regularization techniques, dimensionality reduction, neural networks
Certifications & Training	Google Data Analytics Professional Certificate (Coursera)

Relevant Work Experience

CMU Department of Mathematical Sciences

Graduate Researcher — **Aug 2020 – May 2022**

- Designed a neural network based alternating minimization algorithm and a random feature based algorithm to learn a reduced order model for applications in multiple scientific domains such as aerospace engineering, fluid dynamics, weather prediction, and wind turbine design
- Developed a Python package to implement these models utilizing a combination of original code and several Python machine learning/data science frameworks such as PyTorch, scikit-learn, and NumPy
- Experimentally demonstrated the robustness of these models in the data scarce setting–a regime not typically well suited for standard machine learning models
- Published (co-authored with academic advisor Hayden Schaeffer) and presented "Reduced Order Modeling Using Shallow ReLU Networks" at the 2021 Conference on Mathematical and Scientific Machine Learning

Research Mentor — **Jun 2020 – Aug 2020**

- Mentored 4 undergraduate research students for CMU's "Summer Experiences in Mathematical Sciences" through weekly check-in meetings to resolve any problems and to advise them on possible next steps
- Trained students by discussing best practices for using neural networks towards successfully modeling dynamical systems and further guided them on other project tasks such as creating usable datasets and clearly presenting results

Teaching Assistant for "Numerical Analysis" — **Aug 2021 – Dec 2021, Aug 2020 – Dec 2020**

- Created Jupyter Notebook based lessons and led weekly computer lab sessions for ~40 students to facilitate their ability to apply theory from lecture to real world examples
- Demonstrated to students how to use Python libraries such as NumPy and Matplotlib to effectively analyze and visualize data in clear and meaningful ways

Project Experience

Google Data Analytics Capstone Project — **Nov 2022**

- Cleaned and analyzed bike-share data 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 a dashboard in Tableau to effectively support and share the results of the analysis