

# Katherine Keegan

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## EDUCATION

### Bachelor of Science, Honors

*Aug. 2018 - May 2022*

#### Mary Baldwin University

*Staunton, VA*

- Cumulative GPA: 4.00/4.00
- Majoring in Applied Mathematics with dual minors in Physics and Leadership Studies
- Began college as a full-time student through the Program for the Exceptionally Gifted at age 14
- Completed an honors research project in the applications of Hilbert spaces in Linear Algebra course and a modeling project in aerospace control theory for Differential Equations course

## RELEVANT SKILLS

Python (experienced with using NumPy, SciPy, Matplotlib libraries) • MATLAB (experienced with Simulink) • Jupyter Notebook (experienced with Plotly) • Git version control • Microsoft Office • Google Suite • LaTeX typesetting • Data analysis and visualization • Technical writing • Numerical methods • Statistical methods (regression, ANOVA, nonparametric tests) • Fluency in Japanese and English

## RELEVANT COURSEWORK

Linear Algebra • Mathematics & Programming • Multivariable Calculus I • Ordinary Differential Equations • Numerical Analysis & Computing • Real Analysis • Discrete Mathematical Structures • Physical Chemistry • Statistics I & II • Materials Science, Complex Analysis, Multivariable Calculus II (Spring 2021)

## RESEARCH INTERESTS

Machine learning • Algorithm design • Data science • Artificial intelligence • Scientific computing

## WORK EXPERIENCE

### Summer Undergraduate Researcher

*Jun. 2020 - Jul. 2020*

#### Brown University

*Providence, RI*

- Participated in the Summer@ICERM paid undergraduate research program at the Institute for Computational and Experimental Research in Mathematics
- Conducted extensive research on applications of the singular value decomposition (SVD), mainly focusing on SVD-based data analysis and digital ownership protection methods
- Applied principal component analysis (PCA) to COVID-19 dataset, analyzing trends among states and creating 3-D interactive visualizations of the principal components to illustrate results
- Assisted with the development of a modified SVD-based watermarking scheme and constructed plots to illustrate the improved efficiency and watermark extraction accuracy of the scheme
- Continuing to collaborate with groupmates to further refine research from summer program

## **Teaching Assistant**

*Sep. 2019 - Present*

### **Mary Baldwin University**

*Staunton, VA*

- Assisted with teaching and grading of Precalculus in Fall 2020, currently the teaching assistant for two sections of Calculus I
- Organized review sessions for Precalculus and helped with exam preparation; currently providing virtual assistance and supplementary tutoring for Calculus I students

## **Tutor**

*Jan. 2020 - Present*

### **Mary Baldwin University**

*Staunton, VA*

- Providing individual instruction and guidance with Physics, Japanese, and Mathematics courses

## **EXTRACURRICULAR ACTIVITIES**

### **Student Pilot**

*Sep. 2019 - Present*

#### **Blue Ridge Aviation**

*Weyers Cave, VA*

- With funding provided from Mary Baldwin University's Experiential Learning Grant, began flying lessons with goal of obtaining a private pilot certificate to pursue interest in spaceflight
- Completed first solo flight in Sep. 2020 at age 16; anticipating certification in Apr. 2021 at age 17

### **Math Club Secretary**

*Sept. 2019 - Present*

#### **Mary Baldwin University**

*Staunton, VA*

- Managing club communication; working on expanding scope of club to assist those struggling in math classes across the broader campus community
- In fall 2020, developing novel ways to adapt club activities to a socially-distanced format, including online homework/tutoring opportunities and virtual coding seminars

### **Virginia Women's Institute for Leadership**

*Jan. 2019 - Present*

#### **Mary Baldwin University**

*Staunton, VA*

- Member of the only all-female corps of cadets in the nation, a university program led by military staff preparing women for leadership positions in both military and civilian careers
- Currently holding second-cadet-in-command position as the Executive Officer, responsible for the coordination of specialized staffs to support the education of ~100 cadets
- Anticipating completion of the VWIL Advanced Leadership Certificate in May 2022

## **SELECTED HONORS AND AWARDS**

- Craig Hanson '74 Memorial Scholarship (given to a rising VWIL junior demonstrating high academics and respect of peers) (2020)
- First Year Calculus Award (given to the freshman with the highest average in Calculus 1 & 2) at Mary Baldwin University (2019)
- Alpha Lambda Delta First Year Honors Society (2019)
- Experiential Learning Grant at Mary Baldwin University (2018)
- President's Scholarship at Mary Baldwin University (2018)