

**Jonathan A. Zhu**  
712 Howard Street, Wheaton IL 60187  
425-394-6897 • [jonathan.zhu@wheaton.edu](mailto:jonathan.zhu@wheaton.edu) • [jonzhu2000@gmail.com](mailto:jonzhu2000@gmail.com)  
[jonazhu.github.io/portfolio](https://jonazhu.github.io/portfolio)

## PERSONAL STATEMENT

I am an experienced teaching and research assistant with extensive work on both research publications and teaching materials; my prior coursework also provides me with a myriad of both laboratory and computing skills. I recently completed a Master's degree in Computational Biology at Carnegie Mellon University, with a BS in Biology and BS in Mathematics from Wheaton College.

## EDUCATION

<b>M.Sc in Computational Biology (GPA: 4.04/4.0)</b> Carnegie Mellon University, Pittsburgh, Pennsylvania, USA	<b>2025</b>
<b>B.Sc. in Mathematics, specialization in Statistics (GPA: 4.0/4.0)</b> Wheaton College, Wheaton, Illinois, USA	<b>2023</b>
<b>B.Sc. in Biology (GPA: 3.94/4.0)</b> Wheaton College, Wheaton, Illinois, USA	<b>2023</b>

## RESEARCH PUBLICATIONS

Winata, K., **Zhu, J. A.**, Hanselman, K. M., Zerbe, E., Langguth, J., Folino-Rorem, N., & Cartwright, P. (2024). Life Cycle Transitions in the Freshwater Jellyfish *Craspedacusta sowerbii*. *Biology*, 13(12), 1069. <https://doi.org/10.3390/biology13121069>

**Zhu, J. A.**, & Folino-Rorem, N. C. (2024). Effectiveness of Sampling Techniques in Collecting the Polyp Stage of the Invasive Freshwater Hydrozoan *Craspedacusta sowerbii*. *Biology*, 13(8), 645. <https://doi.org/10.3390/biology13080645>

P. Isihara, **J. A. Zhu**. Clique enumeration in a math capstone course. *PRIMUS*. (Accepted).

## OTHER PUBLICATIONS AND MANUSCRIPTS

**J. A. Zhu**. Exploratory Data Analysis, in *An Introduction to Python Jupyter Notebooks for College Math Teachers*, pages 155-230. Open Textbook Library, <https://open.umn.edu/opentextbooks/textbooks/1697>

**J. A. Zhu**, C. Wagner, Y. Li. Advanced Data Analysis, in *An Introduction to Python Jupyter Notebooks for College Math Teachers*, pages 1015-1115. Open Textbook Library, <https://open.umn.edu/opentextbooks/textbooks/1697>

## CONFERENCE AND OTHER PRESENTATIONS

**J. A. Zhu**, N. C. Folino-Rorem. “A novel sampling method for collecting the polyp stage of the invasive freshwater hydrozoan *Craspedacusta sowerbii* in aquatic habitats.” 23rd International Conference on Aquatic Invasive Species (ICAIS), Halifax, Nova Scotia, May 12-16, 2024.

K. Winata, **J. A. Zhu**, J. Langguth, C. G. Davis, M. Perry, N. C. Folino-Rorem, P. Cartwright. “Life Cycle Transitions in the Freshwater Jellyfish, *Craspedacusta sowerbii*.” Society for Integrative and Comparative Biology (SICB) Annual Meeting 2024, Seattle, WA, January 2-6, 2024.

**J. A. Zhu**, P. A. Jantsch. “A Decision Tree Model and Misclassification Metric to Predict Relative Risks of Property Tax Sales in Chicago’s South Side.” Wheaton College 2022 Sciences Research Poster Presentations, Wheaton, IL, October 2022.

## TEACHING EXPERIENCE

08/2020 – present

### Teaching Assistant

Carnegie Mellon University

- Responsibilities include course material preparation, holding office hours for student help, grading homework assignments, and consulting with professor on course schedule
- Courses TA’d: Introduction to Statistical Genetics (02-704), Bioinformatics Data Science Integration Practicum (03-713)

### Teaching Assistant

Wheaton College

- Served as a TA for various biology, mathematics, and computer science courses.
- Responsibilities include interacting with students on a weekly basis to review concepts and answer student questions related to class assessments and course dynamics; grading student homework assignments on a weekly basis, teaching lab techniques, helping professors guide activities, and caring for laboratory organisms
- Relevant courses TA’d: Organization of Life (BIOL 241), Diversity of Life (BIOL 242), Biological Research Methods (BIOL 252), Invertebrate Zoology (BIOL 335), Genetics (BIOL 356), Linear Algebra (MATH 245), Discrete Math/Functional Programming (CSCI 243), Mathematical Statistics (MATH 463)

## RESEARCH EXPERIENCE

### Research Assistant

05/2022 – 05/2023

Wheaton College

Biology: Sampling Methods Experiment

- Addressed research gap of the use of sampling substrates for detection and collection of small bottom-dwelling life cycle stages of invasive freshwater jellyfish
- Designed experiment testing various sampling substrates in lakes throughout the Illinois-Indiana region, analyzed results, and wrote and revised journal article

#### Biology: Life Cycle Transitions Experiment

- Investigated environmental cues on life cycle transition in invasive freshwater jellyfish with professor Dr. Nadine Rorem (PI) via a grant from Illinois-Indiana Sea Grant
- Fed and cared for jellyfish, kept detailed animal count records, organized and maintained lab equipment, designed experiments, mentored other lab assistants, reviewed literature

#### Mathematics: Data Science for Ethiopian Outreach

- Developed data science and mathematical curricula in Python with professors Dr. Paul Isihara (PI), Dr. Thomas Vandrunen, and Dr. Peter Jantsch for teachers in Tigray, Ethiopia
- Wrote, edited and compiled book sections on exploratory data analysis and natural language processing with Jupyter Notebooks

#### Mathematics: Data Science for Improving Housing and Community Life

- Developed data science and machine learning tools in R/Python for nonprofit Sunshine Gospel Ministries in Chicago with professors Dr. Peter Jantsch (PI) and Dr. Paul Isihara
- Reviewed literature on potential impacts of Sunshine's planned community center for Chicago's South Side; literature review was used in a grant application

### ACADEMIC / COURSE PROJECTS

#### Masters' Projects

- *Programming for Scientists*: Created a Go and R pipeline to predict invasive species spread based on database-listed occurrences; pipeline involved retrieval, cleaning, machine learning, and plot creation
- *Machine Learning for Scientists*: Used Jupyter Notebooks to predict the toxicity of various compounds based on molecular traits; project involved implementing machine learning algorithms without advanced library functions
- *Practical Computing for Biologists*: Created a Python script to find potential protein-coding sequences in a bacterial genome; the script will find these sequences, transcribe, and translate the sequences, producing outputs of the found sequences
- *Bioinformatics Data Science Integration Practicum*: Created a Python pipeline to read protein sequences and predict the structure of these sequences; the pipeline can also introduce mutations and predict the effects of these mutations

#### Relevant Masters' Courses

Neural Networks and Deep Learning in Science • Automation of Scientific Research • Biological Modeling and Simulation • Modeling Evolution • Genomics and Epigenetics of the Brain • Computational Molecular Biology and Genomics • Algorithms and Advanced Data Structures • Programming for Scientists • Applied Cell and Molecular Biology • Data Science for Biological Scientists • Practical Computing for Biologists • Bioinformatics Data Science Integration Practicum • Machine Learning for Scientists • Quantitative Genetics

## Undergraduate Projects

- *Research Methods*: Conducted a literature review on eutrophication; proposed and performed an experiment on effects of simulated eutrophication on invasive hydroids
- *Invertebrate Zoology*: Reviewed literature on regenerative capabilities of invasive sea vase tunicate with respect to tunicate age; produced a report and presentation
- *Genetics*: Performed a two-generation controlled cross on the fruit fly *Drosophila*, tracked inheritance of two mutations and a molecular marker, and produced a research paper on results
- *Advanced Cell and Developmental Biology*: Performed an experiment analyzing effect of varying aspirin doses on proliferation of cancerous liver cells; wrote a paper and presented findings

## Relevant Undergraduate Courses

Biological Research Methods • Ecology • Introduction to Bioinformatics • Invertebrate Zoology • Advanced Cell and Developmental Biology • Linear Algebra • Real Analysis • Probability Theory • Mathematical Statistics • Mathematical Modeling

## ACADEMIC SERVICES

- Reviewer for Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), 2023-2025

## AWARDS AND HONORS

Wheaton College Scholastic Honor Society	2023 - present
Dean's List	2019 - 2023
Jonathan Blanchard Undergraduate Scholarship	2019 - 2023

## RELEVANT SKILLS

### Biological Laboratory skills

DNA extraction • PCR • gel electrophoresis • invertebrate care and husbandry • mammalian cell culture • fluorescence microscopy • chemical handling and disposal • biohazard handling • sterile technique

### Computational skills

Python (incl. packages: pytorch, pytorch-geometric, scikit-learn, pandas, numpy, matplotlib, scipy, tensorflow, seaborn, biopython) • Golang • R (incl. packages: ggplot2, dplyr, biomod2, parsnip, factoextra, ClusterR, rpart, raster, fastqc) • Jupyter Notebooks • GitHub • LaTeX • HTML/CSS • JavaScript • RMarkdown • Statistical Inference • Exploratory Data Analysis • Unix (incl. Supercomputing clusters, HALPER, halliftover, MEME-suite, bedtools, samtools, salmon, bowtie2)

### Writing skills

Scientific writing • Teaching material writing • Literature review • Creative writing