

EDUCATION

University of Washington – Seattle, WA 2022

B.S. in Mathematics, Honors

B.A. in Dance

RESEARCH PROJECTS

Senior Thesis

October 2021 - June 2022

Mentor: Gaku Liu

- Monotone paths on polytopes.
- Working to prove a generalized Baues problem.
- Examining the poset of cellular strings.

Paper: *All cellular strings on polytopes at once*

Decomposability and Simon's Conjecture

July 2021 - August 2021

Mentors: Anton Dochtermann and Suho Oh

Texas State University REU

- Generating conditions for stuck complexes.
- Generalizing flag complexes.
- Finding conditions for adding facets to 1-decomposable complexes.

Matching Graphs

September 2019 - June 2021

Mentors: Bennet Goeckner and Rowan Rowlands

- Iterated Jump Graphs
 - * We look at the jump graph operation under iteration and find the end behavior of any given graph.
 - * Paper *Iterated Jump Graphs* joint with Legrand Jones II.
Accepted to Rose-Hulman Undergraduate Journal. [arxiv](#). [publication](#).
- Buchsbaum Complexes
 - * We characterize all graphs whose matching complex is a two-dimensional Buchsbaum complex.
 - * Paper *A characterization of two-dimensional Buchsbaum matching complexes* joint with Jones, Goeckner, Rowlands.
Accepted to The Electronic Journal of Combinatorics. [arxiv](#).

INDEPENDENT PROJECTS

YouTube Channel [GrapefruitGecko](#)

June 2019 - present

Personal YouTube channel devoted to math communication and visual explanation.

UW Dance Majors Concert choreography

March 2022

I lift up my eyes to the hills.

- Dance piece inspired by the optimal solution to the Tower of Hanoi puzzle.
- I set up a display with the Tower of Hanoi and information about the puzzle in the lobby.
- Experimenting in ways to engage a general audience with math.

Finite Subgroups of Möbius Transformations

April 2020 - June 2020

Explanatory paper for Complex Analysis (MATH 336) at University of Washington.

- I prove Klein's result that all Möbius Transformations are isomorphic to a cyclic group, a dihedral group, or the symmetry group of a platonic solid.

Modular Multiplication Around a Circle

Summer 2019 - present

Github Repository. YouTube video.

- These are visual representations of multiplying members of $\mathbb{Z}/m\mathbb{Z}$ by some integer a . The caustics of the pictures produced are epicycloids.
- I examined the appearance of the cardioid in the 2-times table and the connection to rolling curves.
- I am currently working on characterizing patterns produced by certain relationships between m and a .

RELEVANT WORK EXPERIENCE

- **National Museum of Mathematics** July 2022 - July 2023
Working as a docent, interacting with visitors, developing math communication content.
- **Mathnasium of Northwest Seattle** May 2019 - September 2020
Tutoring children in various levels of math (6 - 16 yrs).
- **Individual Tutoring** September 2017 - January 2019
Tutoring high school students in pre-calculus and calculus.

SKILLS AND INTERESTS

- Programming in Sage, Python, Java, MATLAB, Html
- LaTeX and Beamer formatting
- Video and sound editing
- Photography and videography
- Mathematical and non-mathematical origami
- Obscure Rubik's cube puzzles
- Crocheting hyperbolic space

AWARDS AND SCHOLARSHIPS

- Barbara Sando Scholarship in Mathematics
2020-21, 2021-22
Scholarship for outstanding undergraduate women in mathematics.
- WA State Opportunity Scholarship
2018 - 2022
Scholarship for promising WA state students in STEM fields.
- Annual Dean's List of Academic Excellence
2019, 2020, 2021, 2022
- Dean's Medal for the Natural Sciences
2022
Award for a single undergraduate in the natural sciences at U Washington. Nominated by math faculty and selected by a committee of natural sciences faculty.