Jason Ranoa · Curriculum Vitae

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EDUCATION

March 2024.	**Master of Science in Mathematics.** **Oregon State University (OSU).** Corvallis, OR 97331. GPA 3.89. Focus: Topological Data Science and Algebraic Topology.
May 2021.	**Bachelor of Science in Mathematics** with a minor in Computer Science. **University of Wisconsin-Parkside.** Kenosha, WI 53144. GPA 3.877. Graduated Magna Cum Laude (GPA 3.700 - 3.899). Dean's List for 4 terms.

WORKS AND PROJECTS

Feb. 2024.   ***An Exposition on the Algebra and Computation of Persistent Homology.***
An expository paper written for my MS degree in Mathematics talking about the algebra and calculation of the persistent homology of $\mathbb{N}_0$-indexed filtrations of simplicial complexes with coefficients in a field $\mathbb{F}$, in the lens of the more modern characterization of persistence modules as functors. Submitted February 2024 and with corrections submitted August 2024.
[ScholarsArchive@OSU link][arXiv link]

WORK EXPERIENCE (TEACHING-RELATED)

Sept. 2021 - Mar. 2024.   **Graduate Teaching Assistant (GTA).**
Oregon State University. Corvallis, OR 97331.

Coordinated with instructional staff and employed active and equitable pedagogical methods to achieve course goals. Tasked with leading recitation sections, with each section consisting of a maximum of 35 students and meeting once a week.

Assignments by quarter:

- Fall 2021   MTH 241 Calculus for the Social Sciences
- Winter 2022   MTH 252 Integral Calculus
- Spring 2022   MTH 251 Differential Calculus
- Fall 2022   MTH 241 Calculus for the Social Sciences
- Winter 2023   MTH 227 Calculus and Probability for the Life Sciences I
- Spring 2023   MTH 228 Calculus and Probability for the Life Sciences II
- Fall 2023   MTH 252 Integral Calculus
- Winter 2024   MTH 252 Integral Calculus

Tutored at the Mathematics and Statistics Learning Center (MSLC) both in-person and virtual via Teams. Topics include: College Algebra and Trigonometry, Calculus (Single Variable and Multivariable), Introductory Probability, Discrete Mathematics, Introductory Proof-writing, Matrix Algebra, Sequences and Series, Linear Algebra.

June 2023 - Aug. 2023.   **Instructor, Mathematics.**
Oregon State University. Corvallis, OR 97331.

Taught the following courses:

- Summer 2023 (4-week)   MTH 264 Introduction to Matrix Algebra
- Summer 2023 (4-week)   MTH 265 Introduction to Series

Jan. 2022 - May 2022.	**Virtual Math Tutor.** **Linn-Benton Community College.** Tutored: College Algebra, Trigonometry, and Single Variable Calculus.

Sept. 2020 - May 2021.	**Grader, Undergraduate Computer Science (CS)**
	University of Wisconsin-Parkside. Kenosha, WI 53144.
	
	Assignments by semester:
	
	  − **CSCI 340 Data Structures and Algorithms.** Spring 2021.
	    Graded projects written in Java and provided feedback to students.
	
	  − **CSCI 245 Assembly Language Programming.** Fall 2020.
	    Graded worksheets and programming assignments written in MIPS. Provided feedback to students while managing re-submissions and corrections for credit.

Aug. 2019 - Aug. 2021.	**Tutor II, Mathematics and Chemistry.** **College of Lake County.** Grayslake, IL 60030. Both in-person and virtual via Zoom. Tutored: College Algebra, Single Variable Calculus, Discrete Mathematics, Introductory and General Chemistry.
Jan. 2018 - May 2019.	**Peer Tutor, Mathematics and Chemistry.** **McHenry County College.** Crystal Lake, IL 60012. Tutored: College Algebra, Single Variable Calculus, Intro and General Chemistry.
Dec. 2018 - April 2020.	**Private Tutor.** Subjects: College Algebra, Introductory Discrete Mathematics, High School Geometry, Introductory and General Chemistry, Introductory Linear Algebra.

WORK EXPERIENCE (NON-TEACHING RELATED)

Jan. 2019 - Aug. 2019.	**Customer Service Representative.** **Walgreens.** Island Lake, Illinois 60042
Jan. 2017 - Dec. 2017.	**Research Assistant.** **McHenry County College.** Crystal Lake, IL 60012.

PROFESSIONAL DEVELOPMENT

Sept. 2021 - May 2023.	**Fellow.** ELITE PD Program. **Engaged Learning, Inclusive Teaching, and Equity: Professional Development (ELITE PD)** is an NSF-funded study led by Dr. Mary Beisiegel with the goal of providing multi-year professional development programs for math graduate teaching assistants (MGTAs) involving evidence-based teaching practices. Program included discussions and projects involving active learning strategies, issues involving equity and inequality in education, culturally responsive pedagogy, development of equitable lesson plans, and assessment of conventional teaching practices.
Jan. 2023 - May 2023.	**Funded Participant.** OMSI Science Communication Fellowship. Attended OMSI's Science Communication "Short Course," a series of four professional development workshops involving focused on building skills to effectively communicate with public audiences. Developed a hands-on activity involving the characterization of 2-dimensional holes

using simplicial homology, with a discussion about how the theory generalizes to higher dimensions.

SEMINARS AND CONFERENCES

Sept. 2022 - Mar. 2023. **Graduate Geometry and Topology Seminar.** Once Weekly. Oregon State University.

Feb. 24 - 25, 2023. **Math for All Conference 2023.** Oregon State University.

Nov. 5 - 6, 2022. **Pacific Northwest Geometry Seminar.** Seattle University.

AWARDS AND ACHIEVEMENT

May 2024. **Academic Achievement Award.** Oregon State University.
Awarded to students for sustained success in academic performance and scholarship.

EXPERIENCE IN INSTRUCTIONAL TOOLS

1. **Canvas.** *3 years experience, instructor-side.*
   Structured and organized course modules and materials; created and managed submission boxes and deadlines; kept relevant information up to date, including course material and grades from external sources such as Gradescope and Webwork.

2. **Gradescope.** *3 years experience, instructor- and grader-side.*
   Graded quizzes and exams with consistent, concise, and descriptive rubrics; organizing submission boxes for homework and activities; scanning in quizzes and exams for grading; importing grades to Canvas; managing regrade requests; publishing quiz results and feedback to students.

3. **LaTeX (LaTeX).** *5 years experience.*
   Typeset worksheets, handouts, and exams for instructional purposes.

4. **Zoom.** *4 years experience involving math instruction and tutoring.*
   Adept with using the screen-share function (usually with an iPad) to help explain mathematics virtually; Set up regular or one-off meetings and appointments (e.g. for office hours).

5. **Desmos, GeoGebra, and various graphing software**. *4 years experience.*
   Developed visual models and representations of concepts such as Riemann sums, tangent lines, graph transformations, linearization and Taylor series expansions, concavity and curvature, slope fields from differential equations, and Cêch complexes.

6. **Various programming languages** such as MATLAB, Mathematica, Python, and Javascript.

RELEVANT COURSEWORK

1. **Point-Set and Algebraic Topology.**
   e.g. topological spaces, operations on spaces, simplicial homology, the fundamental group, basic homological algebra and category theory, topological data analysis.

2. **Abstract Algebra.**
   e.g. vector spaces, groups, rings, modules, graded modules, matrices over PIDs, methods in numerical algebra.

3. **Mathematics Education.**
   e.g. theories and frameworks involving student understanding and learning of mathematics, review and discussion of pedagogical practices.

4. **Real Analysis and Differential Geometry.**
   e.g. metric spaces, Riemann integration, measure theory, Lebesgue integration, complex analysis, differential geometry in $\mathbb{R}^2$ and $\mathbb{R}^3$.

5. **Computer Science (undergraduate).**
   e.g. introduction to data science, data structures and algorithm design, theory of computation, computer architecture, programming languages.