

# Austin Ulrigg

## Curriculum Vitae

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austinulrigg 

### Education

#### University of Washington

B.Sc in Mathematics, Departmental Honors

- GPA: 3.83/4.00

September 2023 – June 2026

Seattle, WA

### Publications / Preprints

#### A Practical Genus Algorithm

Independent Research (Joint w/ Alexander Metzger)

Spring 2024–Winter 2025

Seattle, WA

- Developed a novel algorithm to compute the orientable genus of graphs in  $\mathcal{O}(n(4^m/n)^{n/t})$ .
- Successfully determined the exact genus of several graphs that were previously unknown.
- Paper submitted to *Discrete Mathematics* (Nov 2024). [arXiv:2411.07347](https://arxiv.org/abs/2411.07347).

### Other Research Experience

#### Undergraduate Honors Thesis

Supervisor: François Clément

Fall 2025

University of Washington, Seattle

- Wrote a comprehensive survey on graph embeddings on surfaces, rotation systems, and genus algorithms (including PAGE).
- Investigated the classification of forbidden toroidal minors and related open problems.
- Full text available: [austinulrigg.github.io/thesis](https://austinulrigg.github.io/thesis)

#### Undergraduate Research in Topological Graph Theory

Summer 2025–Present

Advisor: François Clément

Seattle, WA

- Working on an ongoing project on classifying forbidden minors for the torus, specifically for graphs excluding a  $K_5$  minor.

#### Washington Experimental Math Lab Researcher

September 2024–December 2024

Advisor: Professor Stefan Steinerberger

Seattle, WA

- Investigated the asymptotic behavior of the dynamical system described in [arXiv:2409.08961](https://arxiv.org/abs/2409.08961)

#### Washington Experimental Math Lab Researcher

March 2024–June 2024

Advisor: Professor Hadrian Quan

Seattle, WA

- Collaborated with a team under Dr. Hadrian Quan to investigate wave propagation on graphs, focusing on spectral analysis of the graph Laplacian, graph products, and path homotopy.

### Presentations

#### A Practical Genus Algorithm

Nov 2025

Northwest Undergraduate Mathematics Symposium (NUMS)

Bothell, WA

- Contributed talk based on joint work with Alexander Metzger (presented by co-author).

#### A Practical Genus Algorithm

May 2025

UW Undergraduate Research Symposium

Seattle, WA

- Presented a new approach to genus computation using an  $\mathcal{O}(n(4^m/n)^{n/t})$  algorithm, emphasizing theoretical advancements and impacts on computational fields.

**Reading Group Organizer | Topology, Algebra, Linear Algebra, Complex Analysis 2023 – 2025***University of Washington**Seattle, WA*

- Co-organized and led multiple reading groups for 70+ total students, facilitating discussions, grading, and assigning problems.

**Euler Characteristic of a Torus and the Utilities Problem***July 2024**Centralia High School**Centralia, WA*

- Talk for 30 advanced high-school students on surfaces of various genera, Euler's formula, and gave a solution of the utilities problem on a torus.

*Honors and Awards*

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|---|--------------|
| <b>Husky 100</b> (Nominated by Dept. of Mathematics)                  | 2025         |
| <b>Math Alliance Predoctoral Scholar Nominee</b>                      | 2024         |
| <b>Phi Theta Kappa Honor Society</b> (International Honor Society)    | 2021–Present |
| <b>Outstanding Student of the Year Nominee</b> (Centralia College)    | 2022         |
| <b>High School Valedictorian</b> (Rank 1/200+, Centralia High School) | 2022         |
| <b>Merit Scholarships Awarded</b> (Total: \$12,000)                   | 2022         |

*Professional Experience*

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**Mathematics Domain Expert (AI Training)** Aug 2023 – July 2024; Aug 2025 – Present*Outlier AI / Data Annotation**Remote*

- Author and edit complex mathematical prompts and solutions to refine Large Language Model (LLM) reasoning capabilities. Develop and apply rubrics to assess model performance and categorize content by difficulty.

*Outreach and Service*

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**Teaching Assistant (MATH 209) | University of Washington**

Sep 2024 – Present

- Assist with ODEs/PDEs (heat, wave, etc.); grade assignments, provide one-on-one support.

**Mathematics Tutor (CLUE) | University of Washington**

Sep 2024 – Present

- Tutor courses from introductory calculus to abstract algebra.

**Math Student Council | University of Washington**

2024 – Present

- Council Member: Organize study halls and events; act as liaison between students and faculty.

**VP & Recruitment Chair | Theta Delta Chi Fraternity**

2024 – Present

- Elected officer for a 70+ member chapter; oversee recruitment and chapter operations.

**Online Mathematics Community | Volunteer Tutor**

Jan 2023 – Present

- Authored 100,000+ posts in a community of 200k+ members, facilitating math discussions.

**Mathematics Tutor | Mathnasium**

July 2025 – Sep 2025

- Tutored K-12 students, focusing on foundational skills and confidence building.

**Solution Notes: Pearls in Graph Theory | Independent Project**

May 2024 – June 2024

- Authored a 12-page solution set for Hartsfield–Ringel's *Pearls in Graph Theory*. [View Notes]

**STEM Tutor | Centralia College**

May 2020 – June 2022

- Tutored Calculus I-III, Statistics, and Human Biology; supported center operations.

**Summer Credit Retrieval Assistant | Centralia High School**

Summers 2017 &amp; 2018

- Assisted high school students with recovering mathematics and science credits.

*Graduate Coursework*

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Graph Theory (Math 563), Modern Algebra I-III (Math 504-6), Linear Algebra (Math 582-3).

*Other Interests*

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**Hobbies:** Intramural Volleyball (especially beach), Hiking, Dogs, Powerlifting, Reading