

## EDUCATION

**University of Washington – 3.87 GPA**

09/22 – 06/25

BS in Mathematics and CS, Accelerated Honors Math, Math Departmental Honors, UWSO First Violin Section

## RESEARCH EXPERIENCE

**University of Washington – Independent, advised by: Dr. Stefan Steinerberger**

Sep. 2024 – Present

**Practical algorithm for graph embedding.** Graph Theory, Algorithms, Combinatorics. [Link](#).

**Goal:** Design a specialized algorithm optimized for embedding cage graphs.

- **Invented and Implemented** algorithm in [C](#) with visualization and verification in [SageMath](#).
- **Co-authored** the research paper [P1] with fellow Mathematics major Austin Ulrigg.

**Ubiquitous Computing Lab – Advisor: Dr. Shwetak Patel**

Jun. 2024 – Present

**Mathematical models for urban sound localization and battery-free autonomous flight control.**

**Goal:** Low-cost, low-power environmental monitoring to predict disasters like wildfires.

**Statistical lifecycle assessment models for consumer and industrial electronics.**

**Goal:** Democratize access to environmental impact estimates and empower sustainable consumption.

- **Co-authored** the ACM MobiSys 2025 paper by designing statistical and [Computer Vision](#) models.

**ICTD Lab – Advisor: Dr. Richard Anderson**

Sep. 2022 – May 2024

**Digital phone directory for subsistence farmers in rural Tanzania.** [Link](#).

**Goal:** Study the economic impacts of digital agricultural information systems in Sub-Saharan Africa.

- **Led** UW SWE team in multi-million-USD, multi-year collaboration with Cornell, EDI Global, and IRDP.
- **Presented** live [T1,2] and video talks [T3] about the 10K farmers we helped across 5 districts in Tanzania.
- **Co-first-authored** the paper [P2] accepted to ACM SIGCHI 2024 and led statistical analysis.

## FAVORITE PUBLICATIONS

**[P2] – [Peer Reviewed and Published](#), Co-first**

[Economics](#), [ICTD](#)

Ananditha Raghunath, **Alexander Metzger**, Hans Easton, XunMei Liu, Fanchong Wang, Yunqi Wang, Yunwei Zhao, Hosea Mpogole, and Richard Anderson. 2024. eKichabi v2: Designing and Scaling a Dual-Platform Agricultural Technology in Rural Tanzania. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24), May 11-16, 2024, Honolulu, HI, USA. ACM, New York, NY, USA, 16 pages.

**[P1] – [Submitted to Discrete Mathematics](#), Co-first**

[Algorithms](#), [Graph Combinatorics](#)

**Alexander Metzger** and Austin Ulrigg. An Efficient Genus Algorithm Based on Graph Rotations.

## TALKS

**[T4] – [Graph Algorithms, Discrete Combinatorial Optimization, and Genus](#)**

May 2025

University of Washington Undergraduate Research Symposium, Seattle, WA

**[T4] – [Computational Linguistics for Machine Aided Pronunciation Learning](#)**

Oct. 2024

University of Washington Computational Linguistics Group, Seattle, WA

**[T3&2] – [eKichabi v2: Designing and Scaling a Dual Platform Technology in Rural Tanzania](#)**

May 2024

ACM SIGCHI Video Presentation, Remote AND Design Use Build's Para.chi Event, Seattle, WA

**[T1] – [Designing and Deploying Digital Information Systems in Sub-Saharan Africa](#)**

Oct. 2023

University of Washington CHANGE Seminar, Seattle, WA

WORK EXPERIENCE

<b>Koel Labs – Founder and CEO</b>	Aug. 2024 – Present
<ul style="list-style-type: none"><li>◦ <b>Raised \$100K in funding</b> from Microsoft and partners [H3,5,6] for computational linguistics research.</li><li>◦ <b>First authoring</b> machine learning papers and talks [T4] on novel mathematical modeling of speech.</li></ul>	
<b>Gooey.AI – Software Engineer</b>	Jun. 2023 – Sep. 2024
<ul style="list-style-type: none"><li>◦ <b>Mentored</b> team of 4 interns through merging 70 pull requests touching 1000s of daily active users.</li><li>◦ <b>Deployed ML</b> solutions to 10M+ farmers across 5+ countries, demoed to 193 world leaders at the UN.</li></ul>	

LEADERSHIP

<b>Seattle Tutoring Partners – Founder and Research Mentor</b>	May 2022 – Present
<ul style="list-style-type: none"><li>◦ <b>Mentoring</b> K-12 students through Calculus, Stats, Algebra, and internationally recognized research.</li><li>◦ <b>Serving 500+ youth musicians</b> and <b>10K+ aspiring scientists</b> through custom mathematical software.</li></ul>	
<b>Cascade Enrichment – Technical Lead</b>	Sep. 2022 – Sep. 2024
<ul style="list-style-type: none"><li>◦ <b>Managed</b> math curriculum for 30+ tutors and online math assessment platform for 100+ students.</li></ul>	
<b>Design Build Fly – Lead Computer Scientist</b>	Sep. 2023 – Sep. 2024
<ul style="list-style-type: none"><li>◦ <b>Coordinated</b> aerodynamic modeling and optimization team of 30; secured international 3rd place [H2].</li></ul>	
<b>Akvelon, Inc. – Intern Software Development Manager</b>	Jun. 2023 – Aug. 2023
<ul style="list-style-type: none"><li>◦ <b>Led</b> team of 4 to make open-source accessibility contributions to 7 Microsoft data analysis tools [H1].</li></ul>	

HONORS AND DISTINCTIONS

<b>[H6] Meta+8VC Next Llama Stack Hackathon: 1st Place, \$1K Prize</b>	2025
<b>[H5] Microsoft Imagine Cup: Semifinalist, \$5K cloud credits</b>	2025
<b>[H4] CRA Outstanding Undergraduate Researcher Award: Honorable Mention</b>	2025
<b>[H3] Mozilla Builders Accelerator: \$39K research grant, \$35K cloud credits</b>	2024
<b>[H2] Design Build Fly Annual Competition: International 3rd Place</b>	2024
<b>[H1] Akvelon Mentor’s Choice: Outstanding Leadership</b>	2023

MATH SKILLS

<b>Computational Tools:</b> Mathematica, SageMath, Matlab, PyTorch, C/C++	3+ years
<b>Classes:</b> Abstract+Linear Algebra, Combinatorics, Probability, Numerical Analysis, Stats	3+ years
<b>Applied:</b> Aerodynamics, Antenna Design, Machine Learning, Economics, Teaching	3+ years
<b>Research:</b> Study Design, Clinical Trials, Paper Writing, Grant Applications, Presentation	3+ years