Alexander Metzger
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Education

University of Washington – *3.87 GPA, 3.96 in CS* 09/22 – 06/26

BS+MS in Computer Science, BS in Mathematics, UWSO First Violin Section, Accelerated Honors Math

Research Experience

University of Washington – *Advisor: Dr. Stefan Steinerberger* Sep. 2024 – Present

Practical algorithms 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 Python.
- **Co-authored** the research paper [P3] by writing 50% of the paper, 100% of the code, 80% of the figures.

Ubiquitous Computing Lab – *Advisor: Dr. Shwetak Patel* Jun. 2024 – Present

Battery-free flight-based sensor systems for environmental monitoring and alerts. Embedded ML.

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

Multi-modal automated lifecycle assessments of consumer electronics. ML for sustainability.

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

- **Co-authored** study design and research paper [P4] by leading the data collection effort for 1000s of products and designing the Computer Vision pipeline, UI, model training and evaluation framework.

ICTD Lab – *Advisor: Dr. Richard Anderson* Sep. 2022 – May 2024

Digital phone directory for subsistence farmers in rural Tanzania. ICTD. Link.

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

- **Presented** live (Para.chi DUB [T2] and CHANGE Seminar [T1]) and video talks [T3].
- **Co-first-authored** the paper [P5] accepted to ACM SIGCHI 2024.
- **Led** development of the USSD server and later also the Android App.

Publications

[P5] – *Peer Reviewed and Published, Co-first* HCI, 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.

[P4] – *Peer Reviewed and Published, Third* ML, CV, HCI

Zhihan Zhang, Puvarin Thavikulwat, **Alexander Metzger**, Yuxuan Mei, Felix Hähnlein, Zachary Englhardt, Gregory D. Abowd, Shwetak Patel, Adriana Schulz, Tingyu Cheng, and Vikram Iyer. 2025. Living Sustainability: In-Context Interactive Environmental Impact Communication. Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. 9, 3, Article 153 (September 2025), 42 pages. https://doi.org/10.1145/3749488

[P3] – *Pre-print, Co-first* Algorithms, Graph Combinatorics

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

[P2] – *Accepted Honors Thesis, First* Topology, Graph Theory, Algorithms

Alexander Metzger. A Practical Algorithmic Approach to Graph Embedding. University of Washington. Department of Mathematics. Honors Thesis. https://sandergi.com/images/UndergraduateMathThesis.pdf

[P1] – *Pre-print, First* HCI, CV, Medical ML

Alexander Metzger and Aureole. Digitized Concussion Tests Using Computer Vision and Speech Recognition.

Talks

[T7] – *Building Inclusive Speech Technology* Apr. 2025
DubHacks Next Demo Day, Seattle Washington, WA

[T6] – *The Future of Language Learning* Dec. 2024
Mozilla Builders Accelerator Demo Day, San Francisco, CA

[T5] – *Computational Linguistics for Machine Aided Pronunciation Learning* Oct. 2024
University of Washington Computational Linguistics Group, Seattle, WA

[T4] – *Local AI and Machine Aided Pronunciation Learning* Sep. 2024
Mozilla Builders Accelerator Kickoff Event, New York, NY

[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

Koel Labs – *Founder and CEO* Aug. 2024 – Present
- **Raised $100K in funding** from Mozilla [H2], Next, and partners for computational linguistics research.
- **First authoring** ML and HCI papers, leading team of 3, training SoTA models with PyTorch.

Gooey.AI – *Software Engineer* Jun. 2023 – Sep. 2024
- **Mentored** team of 4 interns through merging 70 pull requests touching 1000s of daily active users.
- **Deployed** ML solutions to 10M+ farmers across 5+ countries, demoed to 193 world leaders at the UN.

Akvelon, Inc. – *Software Development Intern* Jun. 2023 – Aug. 2023
- **Led** team of 4 to make 200K open-source contributions to 7 Microsoft repos across 27 pull requests [H1].

Leadership

Seattle Tutoring Partners – *Founder and Research Mentor* May 2022 – Present
- **Mentoring** research projects for High Schoolers, and collaborating on internationaly recognized projects .
- **Developed** software for 500+ youth musicians and antenna software for 10K+ aspiring scientists.

Cascade Enrichment – *Technical Lead* Sep. 2022 – Sep. 2024
- **Managing** remote certification and coding curriculum for 30+ tutors; online platform for 100+ students.

Design Build Fly – *Lead Computer Scientist* Sep. 2023 – Sep. 2024
- **Coordinated** optimization algorithms and data analysis for 30 engineers; we placed 3rd nationally.

Honors and Distinctions

[H5] Meta+8VC Next Llama Stack Hackathon: 1st Place, $1K Prize 2025
[H4] Microsoft Imagine Cup: Semifinalist, $5K cloud credits 2025
[H3] CRA Outstanding Undergraduate Researcher Award: Honorable Mention 2025
[H2] Mozilla Builders Accelerator: $39K research grant, $35K cloud credits 2024
[H1] Akvelon Mentor's Choice: Outstanding Leadership 2023

Programming Skills

Languages: JavaScript, TypeScript, Python, Java, C, C++, C#, SQL 7+ years
Tech: Cloud (GCP, Azure, AWS), REST, Pytorch, Auto Testing, React, Docker, Unix, Git 4+ years