# Alannah Oleson, Ph.D.

Assistant Professor, Computer Science
University of Denver

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I pursue ethical, equitable, and liberatory CS education by partnering with educators to explore novel strategies for teaching and learning critical HCI/UX design skills within postsecondary computing education.

## Education

2018-2023 **University of Washington**, Seattle, WA, USA
Ph.D. in Information Science
Dissertation: *Integrating Inclusive Design and Computing Education*
Advisor: Amy J. Ko

2021 **University of Washington**, Seattle, WA, USA
M.S. in Information Science
General Exam: *Toward Justice-Centered Software Design & Development*
Advisor: Amy. J. Ko

2014-2018 **Oregon State University,** Corvallis, OR, USA
Honors B.S. in Computer Science, summa cum laude
Thesis: *Pedagogical Content Knowledge for Teaching Inclusive Software Design*
Advisor: Margaret M. Burnett

## Research Experience

Sept. 2024 **Assistant Professor**
Ritchie School of Engineering and Computer Science, University of Denver
*Exploring novel integrations of critical design content into computing education contexts, such as inclusive design of data schemas, methods for teaching ethical interface design, and more.*

2023-2024 **Postdoctoral Scholar & Co-Founder**
Center for Learning, Computing, and Imagination, University of Washington
*Led an Action Research study with a community of computing educators on best practices for teaching and learning critical interface design skills within postsecondary computing courses.*

2018-2023 **Graduate Research Assistant**
Code & Cognition Lab, University of Washington (Advisor: Amy J. Ko)
*Led several research projects on justice-centered computing education and inclusive design education, including (though not limited to) a critical review of demographic data trends within computing education research and a freely-accessible digital book to help computing faculty integrate accessibility topics into their college-level computer science courses.*

2017-2018 **Procedural Imaging Group Intern**
Adobe Research (Mentors: Cynthia Lu, José Echevarria, Radomir Mech)
*Designed, conducted formative user research for, implemented, and patented a proof-of-concept augmented reality (AR) guided selfie and portrait-taking interface for mobile photography.*

2014-2018 **Undergraduate Research Assistant**
EUSES / Gender HCI Lab, Oregon State University (Advisor: Margaret M. Burnett)
*Supported and later led projects on lowering barriers to end-user software engineering through just-in-time help systems and gender-inclusive interface design methods for industry practitioners.*

## Awards & Honors

2023 **Best Paper Award,** ACM ICER
2022 **Best Paper Award for Diversity & Inclusion Contribution**, ACM CSCW
2022 **University of Washington Husky 100**
*Awarded annually to 100 of UW's 60,000 students who make exceptional contributions to research, teaching, mentorship, and service to the institution. Highest honor available for students.*
2018-2023 **Graduate Research Fellowship (GRFP),** National Science Foundation
*$138,000 over 3 years*
2018 **Outstanding Undergraduate Researcher, Finalist,** Computing Research Association (CRA)
2017 **Women-in-Tech Scholar**, Adobe Research
*$10,000 to support scholarship and research*
2017 **Best Paper Honorable Mention**, ACM CHI
2015, 2016 **Drucilla Shepard Smith Academic Excellence Award**, Oregon State University

## Peer-Reviewed Publications

My publications have been cited nearly 800 times, and I have an h-index of 13. (Google Scholar, Oct. 2024)

2024 (In draft) **Teaching Critical Interface Design: Challenges, Strategies, and Factors Influencing Success**
**A. Oleson** et al.
*Through an Action Research Study with postsecondary computing educators, describes four learning trajectories along which instructors attempted to shift students' critical design thinking, detailing several challenges they experienced and strategies they tried along the way.*

**Factors Influencing the Social Help-Seeking Behavior of Introductory Computing Students in a Competitive University Environment**
A.K. Cohen, **A. Oleson**, A.J. Ko
ACM TOCE: Transactions on Computing Education
*Explored how post-secondary CS students sought help on programming assignments, finding both class policies and sociocultural contexts were important in decisions to seek assistance from others.*

2023 **Teaching Inclusive Design Skills with the CIDER Assumption Elicitation Technique**
**A. Oleson**, M. Solomon, C. Perdriau, A.J. Ko
ACM TOCHI: Transactions on Computer-Human Interaction
*Contributed a theoretically grounded teaching method to help CS students identify design assumptions that exclude marginalized users and a case study finding lasting impact on their design approaches.*

★ Best Paper Award
**Funds of Knowledge Used by Adolescents of Color in Scaffolded Sensemaking around Algorithmic Fairness**
J. Salac, **A. Oleson**, L. Armstrong, A. Le Meur, A.J. Ko
ACM ICER: International Computing Education Research Conference
*Found that youth in a summer computing camp used a tiered human lens and then technological lens to reason through algorithmic fairness, often invoking facets of their identities and background knowledge.*

2022 **A Decade of Demographics in Computing Education Research: A Critical Review of Trends in Collection, Reporting, and Use**
**A. Oleson***, B. Xie*, J. Salac, J. Everson, F.M. Kivuva, A.J. Ko
ACM ICER: International Computing Education Research Conference
*Found that most computing education research studied adults, left out key details of data gathering, and often used imprecise aggregate terms to illustrate diversity that reified hegemonic identity norms.*
* = *co-first authors.*

★ Best Paper Award for Diversity & Inclusion Contribution

**Surfacing Equity Issues in Large Computing Courses with Peer-Ranked, Demographically-Labeled Student Feedback**

B. Xie, **A. Oleson**, J. Everson, A.J. Ko

PACMHCI: Proceedings of the ACM on Human-Computer Interaction (presented at CSCW)

*Developed and evaluated a tool that contextualizes student feedback on learning challenges with anonymized demographic data for teaching teams to identify systemic equity issues within their courses.*

2021 **On the Role of Design in K-12 Computing Education**

**A. Oleson**, B. Wortzman, A.J. Ko

ACM TOCE: Transactions on Computing Education

*Disentangled the role of design in K-12 CS education, finding that design ideas are pervasive in curricula and standards, but conflate program space (disciplinary) and problem space (nondisciplinary) design, masking potential challenges to teaching and learning design concepts.*

2020 **Computing Students' Learning Difficulties in HCI Education**

**A. Oleson**, M. Solomon, A.J. Ko

ACM CHI: Conference on Human Factors in Computing Systems

*Investigated learning challenges in HCI design classes, finding that students can struggle to differentiate design from engineering, to interpret feedback and scope design problems, and to design for diversity.*

**Scout: Rapid Exploration of Interface Layout Variations through High-Level Design Constraints**

A. Swearngin, C. Wang, **A. Oleson**, A.J. Ko, J. Fogarty

ACM CHI: Conference on Human Factors in Computing Systems

*Designed, implemented, and evaluated Scout, a system to support designers' ideation of interface layouts, which helped designers accelerate ideation and produce more diverse design ideas than standard tools.*

2018 **Pedagogical Content Knowledge for Teaching Inclusive Design**

**A. Oleson**, C.J. Mendez, Z. Steine-Hanson, C. Hilderbrand, C. Perdriau, M.M. Burnett, A.J. Ko

ACM ICER: International Computing Education Research Conference

*Identified 11 pieces of pedagogical content knowledge for teaching inclusive design in higher education computing courses, including strategies for anticipating and addressing learner resistance, scaffolding perspective-taking, and tailoring instruction to students' prior beliefs.*

**Semi-Automating (or not) a Socio-Technical Method for Socio-Technical Systems**

C.J. Mendez, Z. Steine-Hanson, **A. Oleson**, A. Horvath, C.G. Hill, C. Hilderbrand, A. Sarma, M.M. Burnett

IEEE VL/HCC: Symposium on Visual Languages and Human-Centric Computing

*Through a field study and a controlled 92-participant study, discussed the benefits and drawbacks of semi-automating parts of the software interface inspection process from the perspective of cognitive load.*

2017 ★ Best Paper Honorable Mention

**Gender-Inclusiveness Personas vs. Stereotyping: Can We Have it Both Ways?**

C.G. Hill, M. Haag, **A. Oleson**, C.J. Mendez, N. Marsden, A. Sarma, M.M. Burnett

ACM CHI: Conference on Human Factors in Computing Systems

*Found that using multiple profile pictures on one persona may expand product designers' consideration of multiple genders without harming persona engagement or advancing harmful gender stereotypes.*

**Toward Theory-Based End-User Software Engineering**

M.M. Burnett, T. Kulesza, **A. Oleson**, S. Ernst, L. Beckwith, J. Cao, W. Jernigan, W. Grigoreanu

Chapter in *New Perspectives in End-User Development*, Springer Int'l Publishing

*Highlighted the need for stronger theoretical foundations in end-user software engineering and presented examples of projects that went beyond individual tools to produce general methods and principles.*

**General Principles for a Generalized Idea Garden**
W. Jernigan, A. Horvath, M. Lee, M.M. Burnett, T. Cuilty, S. Kuttal, A. Peters, I. Kwan, F. Bahmani, A.J. Ko, C.J. Mendez, **A. Oleson**
Journal of Visual Languages and Computing
*End-user programmers who are not necessarily interested in learning programming can benefit from a just-in-time help system called the Idea Garden, which is built on the presented generalized architecture.*

2016 **GenderMag Experiences in the Field: The Whole, the Parts, and the Workload**
C.G. Hill, S. Ernst, **A. Oleson**, A. Horvath, M.M. Burnett
IEEE VL/HCC: Symposium on Visual Languages and Human-Centric Computing
*Software practitioners who use the GenderMag method to identify inclusiveness issues in their interfaces engage with personas at a high rate, but may also detour and introduce recording errors during sessions.*

**Programming, Problem Solving, and Self-Awareness: Effects of Explicit Guidance**
D. Loksa, A.J. Ko, W. Jernigan, **A. Oleson**, C.J. Mendez, M.M. Burnett
ACM CHI: Conference on Human Factors in Computing Systems
*Teaching novice programmers explicit problem-solving strategies can positively impact their productivity, self-efficacy, independence, and growth mindset development.*

## Articles (Refereed)

2020 **It Is Time for More Critical Computing Education**
A.J. Ko, **A. Oleson**, M. Kirdani-Ryan, Y. Register, B. Xie, M. Tari, M.J. Davidson, S. Druga, D. Loksa
ACM CACM: Communications of the ACM
*Position article calling for the integration of more critical lenses into computer science education, such as the key ideas that computing has limits, data has limitations, and computer scientists hold responsibility for their creations and design decisions.*

## Workshops & Symposia

2023 **Software Developer Diversity and Inclusion Workshop**
Organizers: D. Ford, E. Murphy-Hill, M. Storey, R. Prikladnicki, Y. Wang
National Institute of Informatics (NII) Shonan Meeting
*In the style of Dagstuhl seminars, this invited workshop brought together leading researchers doing diversity and inclusion work in software engineering to identify challenges, propose goals, and gather best practices to share with practitioners. Publication available at https://shonan.nii.ac.jp/seminars/194/*

**EduCHI 2023: 5th Annual Symposium on HCI Education**
C. Gray, C.M. MacDonald, C. Lallemand, **A. Oleson**, A.R.L. Carter, O. St-Cyr, C. Pitt
EduCHI Annual Symposium on HCI Education @ CHI 2023
*Proposal paper for the symposium, formatted like a conference with research talks and teaching demos.*

2020 **Toward the Development of HCI Pedagogical Content Knowledge**
**A. Oleson**, A.J. Ko
EduCHI Annual Symposium on HCI Education @ CHI'20
*"Unsolved challenge" paper discussing the need for a robust body of HCI pedagogical content knowledge.*

2019 **The GenderMag-Teach Project**
M.M. Burnett, Z. Steine-Hanson, **A. Oleson**
EduCHI Annual Symposium on HCI Education @ CHI'19
*Described how we established and developed an online community of practice for educators teaching gender-inclusive software interface design in their HCI and computing courses.*

2018 **Gender Biases in Software for Problem-Solving**
M.M. Burnett, A. Sarma, C. Mendez, **A. Oleson**, C. Hilderbrand, Z. Steine-Hanson, A.J. Ko
Designing Technologies to Support Human Problem Solving @ VL/HCC'18
*Position paper to call attention to how software can be biased against certain problem-solving styles, especially those favored by women, and how to address these gender-inclusiveness issues.*

## Digital Books

These books are free, online, accessible, and responsive resources for the computing education community. They are not peer-reviewed in the traditional sense, but instead iteratively improved by feedback from community members in response to the rapidly evolving computing field.

2024 **Teaching Accessible Computing**
**A. Oleson**, A.J. Ko, R. Ladner
https://bookish.press/tac/
*Offers foundational knowledge about disability and pedagogy to support CS faculty who want to teach about accessibility in their courses, but don't know where to start. The initial edition of this book contains perspectives from 21 domain experts on how to integrate accessibility into 14 CS courses (intro programming, graphics, data structures, etc.), with more chapters forthcoming in the next year.*

2022 **Critically Conscious Computing: Methods for Secondary Education**
A.J. Ko, A. Beitlers, B. Wortzman, M. Davidson, **A. Oleson**, M. Kirdani-Ryan, S. Druga, J. Everson
https://criticallyconsciouscomputing.org/
*A book for secondary educators who want to teach CS from a more critical lens, examining the discipline and its content knowledge from technical, sociotechnical, and sociopolitical stances.*

**CS and Design** (chapter in Critically Conscious Computing)
Authors: A.J. Ko, **A. Oleson**
https://criticallyconsciouscomputing.org/design
*Describes how design and computing intersect in educational contexts, including the differences between design and engineering mindsets, different pedagogical approaches, and a unit sketch for teaching CS as design-informed engineering.*

## Doctoral Consortia

2022 **CIDER: A Method to Teach Practical Critical Software Design Skills**
**A. Oleson**
SIGCSE DC @ ACM ICER Conference on International Computing Education Research
*Position article calling for the integration of more critical lenses into computer science education, such as the key ideas that computing has limits, data has limitations, and computer scientists hold responsibility for their creations and design decisions.*

2022 **Supporting Critical Software Design Decision-Making in HCI Education**
**A. Oleson**
DUB DC @ University of Washington
*Describes past and proposed research on how to help computing students think more critically about the impacts of their design decisions so that they can create more usable, accessible, and inclusive software.*

## Patents

2018 **Smart Guide to Capture Digital Images that Align with a Target Image Model**
**A. Oleson**, R. Mech, J. Echevarria, C. Lu
Filed as US15/897,951; published as US20190253614A1 and US10574881B2
*Describes an interface model for analyzing a mobile device's camera feed as a picture is being taken and guiding a user to achieve a higher-quality selfie or portrait in real time.*

## Invited Talks

2021 **Panel: Can Researchers Enhance Diversity and Inclusion?**
@ International Conference on Software Engineering (ICSE)
*Recording available at https://youtu.be/6LROK9Zqiks*

2018 **Research Symposium Welcome Address**
@ Celebrating Undergraduate Excellence (CUE) Event, Oregon State University

## Teaching Experience

Assistant Professor **Introduction to Computer Science**, DU COMP 1201 (Fall 2024)
*Designed and implemented (in collaboration with colleagues) an introductory CS course (required for majors/minors, open to all) on algorithmic thinking, career readiness, and ethical perspectives on technology. Students engage in activities and discussions to build CS foundations and identities.*

Pre-Doctoral Instructor **User-Centered Design Methods**, UW INFO 360 (Spring 2020)
*Adapted course materials to support more equitable participation during remote learning; Created original assignments to help students recognize and respond to exclusionary design biases.*

Teaching Assistant **Cooperative Software Development**, UW INFO 442 (Fall 2020)
*Helped adapt course content to equitable remote instruction formats, focusing on needs of the most disadvantaged student groups first, and implementing structures for instructor and peer support.*

**User-Centered Design Methods**, UW INFO 360 (Winter 2019)
*Created formative assessment questions to determine gaps in students' understandings and adapt instruction accordingly; Prepared and delivered lesson on interface evaluation methods.*

Guest Instructor **Computing Education Research Seminar**, UW CSE 599 (Winter 2024)
*Led discussion on the idea of "CS For All" and how to equitably expand CS education access.*

**Design Methods**, UW INFO 360 (Winter 2019)
*Presented an overview of the principles of various empirical and analytical user interface evaluation methods and led a series of active learning activities for students to engage with each method.*

## Students Supervised

I have mentored 17 students (3 grad, 12 undergrad, 2 high school), including at least eleven women, one non-binary person, seven Students of Color, two from rural areas, and five from economically disadvantaged backgrounds. 9 co-authored academic papers with me. At least six have pursued graduate education.

## Service

Associate Editor **ACM Transactions on Computing Education** (Nov. 2024)
*Expertise area: Human-computer interaction (HCI) education and design education research.*

Steering Committee **EduCHI Symposium on HCI Education** (2023-present)
*Providing oversight and guidance to the organizing committee during the transition to a standalone conference in 2024; Liaison to ACM TOCE journal and co-director for early-career researcher workshops.*

Organizer **HCI Pedagogy Workshop**, EduCHI Symposium (2024-present)
*Planned and led the inaugural half-day workshop on HCI pedagogy and pedagogical research for doctoral students, postdocs, and 1st year faculty, which is projected to become a recurring event due to its success.*

Technical Program Chair **EduCHI Symposium on HCI Education** (2023)
*Oversaw the paper review process for the symposium's research and teaching-related submissions and worked with program committee to make final acceptance decisions; Collaborated with the General Chairs to create and promote community-building workshops prior to the symposium.*

**Reviewer** ACM **CHI** Conf. on Computer-Human Interaction; ACM **CSCW** Conf. on Computer-Supported Collaborative Work; ACM **TOCE** (Trans. on Computing Education); ACM **EduCHI** Conf. on HCI Education; ACM **TOSEM** (Trans. on Software Engineering Methodology); **Int'l Journal of Child-Computer Interaction**

**Mentor** **Trans/Queer in HCI Mentorship Program** (2022-2023)
*Providing professional and personal support to students in the Human-Computer Interaction field who are part of the LGBTQIA2S+ community.*

**Chair** **UW iSchool Doctoral Student Association** (2021-2022)
*Organized and presided at DSA meetings and town halls; Led DSA outreach at new student orientation; Advocated for student perspectives to faculty, staff, and administrators.*

**Officer** **Secretary**, UW iSchool Doctoral Student Association (2020-2021)
*Organized and disseminated information internally to doctoral students, including meeting minutes; oversaw internal DSA officer elections.*
**Communications & Outreach**, UW iSchool Doctoral Student Association (2019-2020)
*Administration of internal \& external communications: mailing lists, social media accounts, reports on DSA activity, other outreach channels as requested.*

**Student Volunteer** ACM **CHI** Conference (2019, 20, 22, 23), ACM **SIGCSE** Technical Symposium (2019)
★ *CHI 2019: Received internal SV award "for going above and beyond" typical SV duties to ensure conference participants' accessibility needs were properly met during paper sessions.*

**Student Coordinator** **UW DUB Seminar** (2019-2020)
*DUB (Design, Use, Build) is an interdisciplinary community at the UW focused on HCI and Design which coordinates weekly invited talks with internal and external speakers.*

**Peer Mentor** **OSU STEM Leaders Program** (2015-2018)
*Helped 5 freshmen from underrepresented backgrounds in STEM transition to and succeed in new college environments as they completed original research projects with faculty mentors.*