

Eleanor O'Rourke

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Appointments

2017 – present. Northwestern University, Evanston IL.

June and Donald Brewer Junior Professor in Computer Science and the Learning Sciences.

2016 – present. Northwestern University, Evanston IL.

Assistant Professor with a joint appointment in Computer Science and the Learning Sciences.

2009 – 2016. University of Washington, Seattle, WA.

Graduate Research Assistant.

Education

2016 Ph.D., Computer Science & Engineering

University of Washington, Seattle, WA

Thesis: *Educational Systems for Maximizing Learning Online and in the Classroom*

Advisor: Zoran Popović

2012 M.S., Computer Science & Engineering

University of Washington, Seattle, WA

Advisor: Richard Anderson

2007 B.A., Majors in Computer Science and Spanish

Colby College, Waterville, ME

Graduated Summa Cum Laude

Awards and Honors

Best Paper Honorable Mention: UIST 2018

Google Anita Borg Scholarship, 2015

Society of Women Engineers Outstanding Female Engineer Award, 2014

Best Paper Nomination: EDM 2013

Best Paper Nomination: CHI 2012

NSF Graduate Research Fellowship: Honorable Mention, 2011

Microsoft Research Graduate Women's Scholarship: Recipient, 2010

NSF Graduate Research Fellowship: Honorable Mention, 2010

Refereed Conference and Journal Publications

Top-tier publication venues in human-computer interaction and computer science (e.g CHI, UIST, IJCAI) are highly selective and intended for archival papers only. These conferences often more selective and more visible than journals. In computer science, student authors are traditionally listed first, and advisors are listed last. Below, student authors that I mentored are underlined and undergraduate authors are additionally starred*.

- [1] Jamie Gorson, **Eleanor O'Rourke** (2019). *How Do Students Talk About Intelligence? An Investigation of Motivation, Self-efficacy, and Mindsets in Computer Science*. Proceedings of the ACM International Computing Education Research Conference (ICER 2019).
- [2] **Eleanor O'Rourke**, Eric Butler, Armando Díaz Tolentino, Zoran Popović (2019). *Automatic Generation of Problems and Explanations for an Intelligent Algebra Tutor*. Proceedings of the International Conference of Artificial Intelligence in Education (AIED 2019).
- [3] Joshua Hibschan, Darren Gergle, **Eleanor O'Rourke**, Haoqi Zhang (2019). *Isopleth: Supporting Sensemaking of Professional Web Applications to Create Readily Available Learning Experiences*. ACM Transactions on Computer-Human Interaction (TOCHI 2019).
- [4] Joshua Shi*, Armaan Shah*, Garrett Hedman, **Eleanor O'Rourke** (2019). *Pyrus: Designing A Collaborative Programming Game to Support Problem-Solving Behaviors*. Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2019).
- [5] Sarah Lim*, Joshua Hibschan, Haoqi Zhang, **Eleanor O'Rourke** (2018). *Ply: A Visual Web Inspector for Learning from Professional Webpages*. Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2018). **Best Paper Honorable Mention**.
- [6] **Eleanor O'Rourke**, Erin Peach*, Carol S. Dweck, Zoran Popović (2016). *Brain Points: A Deeper Look at a Growth Mindset Incentive Structure for an Educational Game*. The Third Annual ACM Conference on Learning at Scale (L@S 2016).
- [7] Oleksandr Polozov, **Eleanor O'Rourke**, Adam Smith, Luke Zettlemoyer, Sumit Gulwani, Zoran Popović (2015). *Personalized Mathematical Word Problem Generation*. Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI 2015)
- [8] **Eleanor O'Rourke**, Erik Andersen, Sumit Gulwani, Zoran Popović (2015). *A Framework for Automatically Generating Interactive Instructional Scaffolding*. Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2015).
- [9] Yun-En Liu, Christy Ballweber, **Eleanor O'Rourke**, Eric Butler, Phonraphee Thummaphan, Zoran Popović (2015). *Large-Scale Educational Campaigns*. ACM Transactions on Computer-Human Interaction (TOCHI 2015).
- [10] **Eleanor O'Rourke**, Kyla Haimovitz, Christy Ballweber, Carol S. Dweck, Zoran Popović (2014). *Brain Points: A Growth Mindset Incentive Structure Boosts Persistence in an Educational Game*. Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2014).
- [11] **Eleanor O'Rourke**, Christy Ballweber, Zoran Popović (2014). *Hint Systems May Negatively Impact Performance in Educational Games*. The First Annual ACM Conference on Learning at Scale (L@S 2014).

- [12] Yun-En Liu, Travis Mandel, Eric Butler, Erik Andersen, **Eleanor O'Rourke**, Emma Brunskill, Zoran Popović (2013). *Predicting Player Moves in an Educational Game: A Hybrid Approach*. The Sixth International Conference on Educational Data Mining (EDM 2013). **Best Paper Nomination**.
- [13] **Eleanor O'Rourke**, Eric Butler, Yun-En Liu, Christy Ballweber, Zoran Popović (2013). *The Effects of Age on Player Behavior in Educational Games*. International Conference on the Foundations of Digital Games (FDG 2013).
- [14] Erik Andersen, **Eleanor O'Rourke**, Yun-En Liu, Richard Snider, Jeff Lowdermilk, David Truong, Seth Cooper, Zoran Popović (2012). *The Impact of Tutorials on Games of Varying Complexity*. Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2012). **Best Paper Nomination**.
- [15] Rohit Chaudhri, **Eleanor O'Rourke**, Shawn McGuire, Gaetano Borriello, Richard Anderson (2010). *FoneAstra: Enabling Remote Monitoring of Vaccine Cold-Chains Using Commodity Mobile Phones*. ACM Symposium on Computing for Development (DEV 2010).
- [16] Victoria Interrante, **Eleanor O'Rourke**, Leanne Gray, Lee Anderson, and Brian Ries (2007). *A Quantitative Assessment of the Impact on Spatial Understanding of Exploring a Complex Immersive Virtual Environment using Augmented Real Walking versus Flying*. Proc. of the 13th Eurographics Symposium on Virtual Environments.

Workshop Papers, Extended Abstracts, Works In Progress

- [1] **Eleanor O'Rourke**, Yvonne Chen, Kyla Haimovitz, Carol S. Dweck, Zoran Popović (2015). *Demographic Differences in a Growth Mindset Incentive Structure for Educational Games*. The Second Annual ACM Conference on Learning at Scale Works in Progress (L@S WIP 2015).
- [2] Richard Anderson, Eric Blantz, David Lubinski, **Eleanor O'Rourke**, Mark Summer, and Krysta Yousoufian (2010). *SmartConnect: Last Mile Data Connectivity for Rural Health Clinics*. 4th ACM Workshop on Networked Systems for Developing Regions (NSDR 2010).
- [3] Victoria Interrante, Lee Anderson, Brian Ries, **Eleanor O'Rourke**, and Leanne Gray (2007). *Experimental Investigations into the Feasibility of Using Augmented Walking to Facilitate the Intuitive Exploration of Large Scale Immersive Virtual Environments* [Abstract]. Proc. of the 4th Symposium on Applied Perception in Graphics and Visualization (APGV 2007). vol. 253. ACM, New York, NY, p.144.
- [4] Victoria Interrante, Brian Ries, **Eleanor O'Rourke**, Leanne Gray, Jason Lindquist, and Lee Anderson (2007). *Evaluating Alternative Metaphors for Augmented Locomotion Through Large-Scale Immersive Virtual Environments* [Abstract]. Journal of Vision, 7(9):145, 145a.

Funding

- [1] Eleanor O'Rourke (PI). *Automatically Praising Learning Process to Promote the Growth Mindset in Computer Science*. NSF CRII, 2018-2020, \$174,712.
- [2] Haoqi Zhang (PI) and Eleanor O'Rourke (Co-PI). *Readily Available Learning Experiences: Turning the Entire Web into Progressive Examples to Bridge Conceptual Knowledge Gaps for Novice Web Developers*. NSF Cyberlearning, 2017-2020, \$549,815.
- [3] Jason Hartline (PI), Doug Downey (Co-PI) and Eleanor O'Rourke (Co-PI). *Mechanism Design and Machine Learning for Peer Grading*. NSF Algorithms in the Field, 2017-2021, \$700,000.

Teaching

Instructor

LRN_SCI 451: Design of Playful Learning Environments – Fall 2019

LRN_SCI 301: Design of Learning Environments – Spring 2019

EECS 330: Human-Computer Interaction, Northwestern University – Winter 2017, Winter 2018, Winter 2019

EECS 315/497: Design, Technology, and Research, Northwestern University – Fall 2017

Guest Lecturer

MSAI: Frameworks for Artificial Intelligence. Fall 2018

EECS 101: An Introduction to Computer Science for Everyone, Northwestern University. Fall 2017

CSE 481D: Games Capstone, University of Washington. May 3 & 6, 2016

Women's Studies Class, The Bush School, Seattle WA. November 1, 2013

Teaching Assistant

CSE 481D: Games Capstone, University of Washington, Spring 2014

CSE 143: Computer Programming II, University of Washington, Summer 2011

Mentoring and Advising

PhD Advisor

Jamie Gorson, CS+LS Program, PhD expected 2021

Garrett Hedman, CS+LS Program, PhD expected 2022

Nick LaGrassa, CS+LS Program, PhD expected 2023

Gobi Dasu (co-advised with Haoqi Zhang), CS Program, PhD expected 2023

Harrison Kwik (co-advised with Haoqi Zhang), TSB Program, PhD expected 2024

PhD Thesis Committee

Jue Wu, LS Program, PhD expected 2021

Daniel Feltey, CS Program, PhD expected 2021

Zheng Yuan, CS Program, PhD expected 2020

Drew Harmon Pollock, CS Program, PhD expected 2020

Isaac Johnson, CS Program, Graduated March 2019

Emily Harburg, TSB Program, Graduated September 2018

Joshua Hibsman, CS Program, Graduated June 2017

Undergraduate Students

Salome Kariuki, RALE: knowledge maps (October 2019 – Present)

Armaan Dhingra, playful learning environments (June 2019 – Present)

Andrew Finke, playful learning environments (April 2019 – Present)
Maxine Whitely, RALE: scaffolded exercises (January 2018 – Present)
Daniel Zhu, RALE: knowledge maps (January 2018 – Present)
Armaan Shah, collaborative games for novice programmers (March 2017 – April 2019)
Josh Shi, collaborative games for novice programmers (January 2017 – April 2019)
Suzy Lee, RALE: knowledge maps (September 2018 – March 2019)
David Latimore, RALE: scaffolded exercises (January 2018 – June 2018)
Maggie Lou, independent development plans (January 2018 – March 2018)
Allison Lu, metacognitive behavior tracking (September 2017 – June 2018)
Megan Conlon, metacognitive behavior tracking (September 2017 – June 2018)
Ankita Chowdry, peer grading assessments for reflection (September 2017 – December 2017)
Nneoma Oradiwegwu, independent development plans (September 2017 – March 2018)
Sarah Lim, visual regression pruning for web inspection (March 2017 – October 2018)
Grace Alexander, growth mindset incentives for programming (January 2017 – March 2018)
Morgan Walker, growth mindset incentives for programming (January 2017 – December 2017)
Lily Zhang, growth mindset incentives for programming (January 2017 – December 2017)
Erin Peach, interactive tutorials in Refraction (January 2013 – April 2015)
Mallika Mathur, growth mindset incentives for Refraction (June 2013 – August 2013)

Computer Science Education Team (April 2015 – June 2015)

Advised a team of 13 undergraduate students at UW on a project that used my framework for automatically generating instructional scaffolding to create content for introductory computer science concepts.

Student Honors

NU Undergrad Research Grants awarded to 9 Design, Technology and Research advisees since 2017
Gobi Dasu, Segal Design Cluster Fellowship, 2019
Garrett Hedman, Segal Design Cluster Fellowship, 2018
Josh Shi and Armaan Shan, CHI Student Research Competition, 1st Place, 2018
Jamie Gorson, Segal Design Cluster Fellowship, 2017
Sarah Lim, CHI Student Research Competition, 1st Place, 2017

Invited Talks

- [1] *Environments to Support Motivation and Learning in Undergraduate CS.*
CS+LS Symposium, Northwestern University, Evanston, IL. April 29, 2019.
- [2] *Designing Interactive Systems to Teach Complex Processes.*
PIER Seminar, Carnegie Mellon University, Pittsburg, PA. November 5, 2018.
- [3] *Interdisciplinary Education Research: Challenges and Opportunities.*
PIER Brown Bag Talk, Carnegie Mellon University, Pittsburg, PA. November 6, 2018.
- [4] *Educational Systems for Maximizing Learning Online and in the Classroom.*
HCI Seminar, University of Illinois Urbana-Champaign, Urbana IL. October 3, 2017.
- [5] *Women in Game Design, Panelist.*
Seattle Association for Women In Science Series, Seattle WA. December 17, 2014.

Presentations

- [1] *Automatic Generation of Problems and Explanations for an Intelligent Algebra Tutor.*
International Conference on Artificial Intelligence in Education (AIED 2019), Chicago, IL. June 28, 2019.
- [2] *Brain Points: A Deeper Look at a Growth Mindset Incentive Structure for an Educational Game.*
ACM Conference on Learning at Scale (L@S 2016), Edinburgh, UK. April 25, 2016.
- [3] *Educational Systems for Maximizing Learning Online and in the Classroom.*
Rising Stars in EECS Workshop, MIT, Boston MA. November 9, 2015.
- [4] *A Framework for Automatically Generating Interactive Instructional Scaffolding.*
ACM Conference on Human Factors in Computing (CHI 2015), Seoul, South Korea. April 21, 2015.
- [5] *Automatically Generating Interactive Instructional Scaffolding.*
Computer Science & Engineering Symposium, University of Washington, Seattle WA. January 9, 2015.
- [6] *Brain Points: A Growth Mindset Incentive Structure Boosts Persistence in an Educational Game.*
ACM Conference on Human Factors in Computing (CHI 2014), Toronto, Canada. May 1, 2014.
- [7] *Brain Points: A Growth Mindset Incentive Structure Boosts Persistence in an Educational Game.*
DUB Group Seminar, University of Washington, Seattle WA. April 23, 2014.
- [8] *Hint Systems May Negatively Impact Performance in Educational Games.*
ACM Conference on Learning at Scale (L@S 2014), Atlanta, GA. March 4, 2014.
- [9] *Brain Points: A Growth Mindset Incentive Structure for Educational Games.*
Industrial Affiliates Day, CSE, University of Washington, Seattle WA. October 23, 2013.
- [10] *The Effects of Age on Player Behavior in Educational Games,* Joint presentation with Eric Butler.
International Conference on the Foundations of Digital Games (FDG 2013). May 16, 2013.
- [11] *The Impact of Tutorials on Games of Varying Complexity,* Joint presentation with Erik Andersen.
ACM Conference on Human Factors in Computing Systems (CHI 2012). May 7, 2012.
- [12] *Smart Connect: Investigating Low-Bandwidth Communication for Peripheral Health.*
Qualifying Examination, University of Washington, Seattle WA. February 24, 2011.
- [13] *Smart Connect: A Communication Link for Peripheral Health Facilities.*
Industrial Affiliates Day, CSE, University of Washington, Seattle WA. October 27, 2010.

University Service

Learning Sciences Program

Cognitive Science Committee (2019 – Present)

PhD Admissions Committee (2018)

Brown Bag Colloquium Series Co-Organizer (2017 –2018)

Computer Science Department

Diversity Committee (2019 – Present)

PhD Admissions Committee (2019)

Computer Science + Learning Sciences Program

PhD Admissions Committee (2017, 2018, 2019)

Technology and Social Behavior Program

PhD Admissions Committee (2017)

Academic Service

Grant Referee

2017 National Science Foundation: Education & Human Resources – Advancing Informal STEM Learning

Steering Committee

Executive Member, Learning at Scale Steering Committee (2019 – Present)

Program Committee

2020 ACM Conference on Learning at Scale (*L@S 2020*)

2020 ACM Conference on Human Factors in Computing Systems (*CHI 2020*)

2019 ACM Conference on Learning at Scale (*L@S 2019*)

2019 ACM Conference on Human Factors in Computing Systems (*CHI 2019*)

2018 ACM Conference on Learning at Scale (*L@S 2018*)

2018 ACM Conference on Human Factors in Computing Systems (*CHI 2018*)

2017 ACM Conference on Human Factors in Computing Systems (*CHI 2017*)

2017 Technical Symposium on Computing Science Education (*SIGCSE 2017*)

2017 International Conference on the Foundation for Digital Games (*FDG 2017*)

Reviewer

2019 International Journal of Artificial Intelligence in Education (*IJAIED*).

2019 ACM User Interface Software and Technology Symposium (*UIST 2019*).

2018 ACM User Interface Software and Technology Symposium (*UIST 2018*).

2018 ACM Conference on Human Factors in Computing Systems Late-Breaking Work (*CHI LBW 2018*).

2017 ACM User Interface Software and Technology Symposium (*UIST 2017*).

2017 ACM SIGCHI Annual Symposium on Computer-Human Interaction in Play (*CHI PLAY 2017*).

2017 ACM Transactions on Computing Education (*TOCE 2017*).

2017 ACM Conference on Human Factors in Computing Systems Late-Breaking Work (*CHI LBW 2017*).

2016 ACM User Interface Software and Technology Symposium (*UIST 2016*).

2016 ACM Conference on Human Factors in Computing Systems (*CHI 2016*).

2016 ACM Conference on Computer-Supported Cooperative Work and Social Computing (*CSCW 2016*).

2015 Conference on Human-Computer Interaction with Mobile Devices and Services (*Mobile HCI 2015*).

2015 ACM Conference on Human Factors in Computing Systems (*CHI 2015*).

2014 ACM Conference on Human Factors in Computing Systems (*CHI 2014*).

2013 ACM Conference on Human Factors in Computing Systems Works-In-Progress (*CHI WIP 2013*).

2013 ACM Conference on Human Factors in Computing Systems Student Game Competition (*CHI SGC 2013*).

Community Service

Graduate Women in Computing (GWiC), 2019 – Present

Faculty advisor for the graduate women in computing group at Northwestern.

BuildHER Hackathon Judge, 2017

Served as a judge for the all-female undergraduate student hackathon BuildHER, hosted at Northwestern.

Center for Game Science Outreach, 2011 – 2016

Organized school visits to the Center for Game Science involving research presentations and gameplay.

Prospective Student Visit Days Co-Chair, UW CSE Department, 2013

Worked with faculty, staff, and students to organize visit days, with a focus on recruiting female students.

Graduate Mentoring Program Coordinator, UW CSE Department, 2011 – 2013

Re-designed the mentoring program for new graduate students, and served as program coordinator.

Change Seminar Organizer, UW CSE Department, 2010-2011

Coordinate talks by external speakers and facilitate group discussions.

Industry Employment

Associate Developer, Outcome Sciences, Cambridge, MA (2007 – 2009)

Position as a full-time developer for Outcome Sciences (now Quintiles), a medical research company focused on developing patient registries. Work on a team of five using Java, Java Servlets, AJAX, CSS, and SQL to develop new studies and update existing studies. View more online at quintiles.com