

Katherine M. Braught

🌐 <https://katherinebraught.github.io/>

Education

University of Illinois Urbana–Champaign

Ph.D. in Computer Science, Advisor: Jeff Erickson and Colleen Lewis
GPA: 4.0

Area: Computers and Education

Aug 2021–present

University of Illinois Urbana–Champaign

M.S. in Computer Science, Advisor: Sayan Mitra
GPA: 4.0

Area: Formal Methods for Verification

Aug 2021–Aug 2024

Iowa State University, Ames, Iowa

B.S. in Computer Science, University Honors
Summa Cum Laude, Top 2% of College, GPA: 4.0

Minor: Biology

Aug 2016–Dec 2020

Research Interests

My research focuses on making students' experiences in upper-level computer science theory courses engaging and supportive. I approach this by (1) investigating the culture and experiences of students in algorithms courses, (2) developing personalized problem sets for these courses, and (3) training TAs to teach problem-solving effectively.

Teaching

Teaching Assistant Experience

CS 374 Intro to Algs and Models of Comp, UIUC

Teaching Assistant and Discussion Section Leader

Aug 2025–present

- Lead group problem-solving session with 100 students twice a week
- Support undergraduate employees' grading and grade exams

CS 591 Teaching Assistant Training, UIUC

Course Assistant

Aug 2024–present

- Manage attendance of 300 students
- Grade reflection assignments
- Contribute to improving TA training lectures

CS 173 Discrete Structures, UIUC

Teaching Assistant

Aug 2024–May 2025

- Teach weekly tutorials (200+ students) and hold office hours
- Grade biweekly proof-based exams

Instructor Experience

University of Illinois Extension Office

Principal's Scholars Program Pre-Algebra Instructor

November 2025

Developed curriculum to support pre-algebra skills for 26 6-8th grade students

Illinois Mathematics and Science Academy

Motorola CS+X Summer Campus Instructor

June 2025

Taught a 40-hour course to 20 middle school students with a CS + linguistics project. Developed instructional materials that linked Python and core computing concepts to real-world contexts

Guest Lecturing

Teaching and Leadership Eng 590

Teaching Engineering Problem Solving and Meeting Students Where They Are

Fall 2025 & Spring 2024

Lectured approx. 300 graduate teaching assistants on how to teach problem solving

UIUC's Grad Academy

Using Compassionate Pedagogy as a TA

Fall 2025

Using active learning, workshopped with about 60 students on using compassionate pedagogy

UIUC's Grad Academy

Teaching Computer Science Problem Solving and Meeting Students Where They Are

Spring 2025

Lectured approx. 40 computer science graduate teaching assistants on how to teach problem solving

Professional Work Experiences

IBM

Backend Developer: Systems

Jan 2021–Aug 2021

- Developed software in proprietary language for IBMi
- Implemented new data type support for databases

Research Internship Experience

NASA Langley

PhD Student Researcher

Mentor: Alwyn Goodloe, Ph.D.

May 2023–Aug 2023

- Implemented probabilistic monitoring in Copilot
- Developed monitoring examples for safety-critical systems

Air Force Research Lab, Wright-Patterson AFB

PhD Student Researcher

Mentor: Kerrianne Hobbs, Ph.D.

May 2022–Aug 2022

- Synthesized a reinforcement learning controller for the Inspection Problem
- Integrated runtime assurance into RL controllers

Peer-Reviewed Work

Implementing and Evaluating a TA Training on Compassionate Pedagogy

ASEE

Katherine Braught

2026

Under review

A TA Training Lesson for Problem-Solving with Engineers

ASEE

Katherine Braught, Carl Evans, Blake Johnson, Yael Gertner

2026

Under review

A TA Training Lesson for Problem-Solving in CS Theory

SIGCSE

Katherine Braught, Carl Evans, Blake Johnson, Yael Gertner

2026

Under review

Too Theoretical and Nowhere Near Interesting (Formal Methods)

ITICSE

Katherine Braught, Yangge Li, Katherine Driggs-Campbell, Sayan Mitra

2025

Using a Tool to Increase Student Motivation for Formal Methods

DOI: 10.1145/3724363.3729116

Novice Difficulties in Graph Layering for Algorithm Design

SIGCSE

Hongxuan Chen, Katherine Braught, Geoffrey L. Herman, Jeff Erickson

2025

DOI: 10.1145/3641555.3705221

Creating a Community of Graduate Student Computer Science Education Researchers

SIGCSE

Grace Barkhuff, Katherine Braught, Emma R. Dodoo, Michael Link, Xinying Hou, Elliot Roe

2025

DOI: 10.1145/3641555.3705111

Verse: A Python Library for Reasoning About Multi-agent Hybrid System Scenarios

CAV

Y. Li, H. Zhu, K. Braught, K. Shen, S. Mitra

2023

DOI: 10.1007/978-3-031-37706-8_18

Structural and Sequential Cause in Hidden Markov Models

CREST

K. Braught, S. Mitra

2023

Accepted submission only

Checking Phylogenetics Decisiveness in Theory and in Practice

TCBB

Ghazaleh Parvini, Katherine Braught, David Fernández-Baca

2022

DOI: 10.1109/TCBB.2021.3128381

Honors and Awards

2025-2026: University of Illinois Mavis Future Faculty Fellow

2025: UIUC Academy for Excellence in Engineering Education Recognition of Outstanding Student Contribution to a Strategic Instructional Innovations Program project

Service, Leadership, and Outreach

Reviewer

SIGCSE

2026

Reviewer for Experience Report and Birds of a Feather

Scholarship Reviewer

UIUC Outreach Workshops

2024-Present

Work with local students to review scholarship applications to NCWIT Aspirations in Computing

Volunteer Instructor

UIUC Summer Camps

Summer 2024

Worked with Illinois students for a two day workshop at a summer engineering camp

Lead Volunteer Instructor

UIUC CS+X Workshops

2023-Present

Work with local middle and high school students to teach CS+X workshops

Personal Service

Election Judge

Champaign County Clerk Office

2024-present

Ensured fair, free, and accessible election while administering the election process in Champaign county

Member

Junior League of Champaign-Urbana

2023-2025

Partnered with local non-profits and coordinates service projects

Special Events Volunteer

Champaign Parks Department

2022-2024

Supported large community events and resident engagement