

# 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

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### 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

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### 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

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### 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

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**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

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### 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

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### 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