Katherine M. Braught

📱 (563) 570 3362 • 🌐 https://katherinebraught.github.io/

Education

University of Illinois Urbana–Champaign — **Area: Computers and Education**
Ph.D. in Computer Science, Advisor: Jeff Erickson and Colleen Lewis — *Aug 2021–present*
GPA: 4.0

University of Illinois Urbana–Champaign — **Area: Formal Methods for Verification**
M.S. in Computer Science, Advisor: Sayan Mitra — *Aug 2021–Aug 2024*
GPA: 4.0

Iowa State University, Ames, Iowa — **Minor: Biology**
B.S. in Computer Science, University Honors — *Aug 2016–Dec 2020*
Summa Cum Laude, Top 2% of College, GPA: 4.0

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

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.

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   **Mentor: Alwyn Goodloe, Ph.D.**
PhD Student Researcher   *May 2023–Aug 2023*
- Implemented probabilistic monitoring in Copilot
- Developed monitoring examples for safety-critical systems

Air Force Research Lab, Wright-Patterson AFB   **Mentor: Kerrianne Hobbs, Ph.D.**
PhD Student Researcher   *May 2022–Aug 2022*
- Synthesized a reinforcement learning controller for the Inspection Problem
- Integrated runtime assurance into RL controllers

Publications

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

Checking Phylogenetics Decisiveness in Theory and in Practice   **TCBB**
Ghazaleh Parvini, Katherine Braught, David Fernańdez-Baca,   *2022*
DOI: 10.1109/TCBB.2021.3128381

Mentorship & Volunteering

Membership Committee, Junior League of Champaign-Urbana (Aug 2023–Present): Partners with local non-profits and coordinates service projects

Volunteer, UIUC Computer Science Outreach (Aug 2023–Present): Summer camp teaching, NCWIT Aspirations in Computing workshop

Special Events Volunteer, Champaign Parks Department (Jan 2022–Present): Supports large community events and resident engagement