# Alyxander Burns

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# About

I am a Lecturer in Computer Science at Mount Holyoke College. My teaching practice is rooted in the belief that Computer Science education can and should prepare students to contribute actively to a more just and equitable world. In my courses, students engage with the ways that technical course contents impact justice and equity. In my research, I study communicative data visualizations, with a focus on what makes visualizations "good" and research methologies to effectively measure it.

## Education

Sept. 2022	<b>Ph.D. in Computer Science</b> , University of Massachusetts Amherst Area of Study: Data Visualization, advised by Dr. Narges Mahyar Dissertation: "Communicative Information Visualizations: How to make data more understandable by the general public"
Feb. 2020	M.S. in Computer Science, University of Massachusetts Amherst
May 2017	<b>B.A., Major: Computer Science</b> , Mount Holyoke College Summa cum laude in Computer Science

## **Teaching Experience**

Note: Courses marked with \* indicate courses which I developed.

### Mount Holyoke College

#### Introduction to Computational Problem Solving

Spring 2023, Fall 2022 (2 sections), Spring 2020

#### Data Structures

Spring 2023

## Introduction to Computer Science Part 2: Object-Oriented Programming

Fall 2022

### $\mathbf{iDesign} \ \mathbf{Learning} \ \mathbf{Lab} \ (\mathrm{Makerspace} \ \mathrm{course})$

Fall 2022

#### University of Massachusetts Amherst

#### Do Data Speak for Themselves? (First-year seminar)\*

Fall 2021 (2 sections)

Math Puzzles (First-year seminar)\* Fall 2021 (2 sections)

## **Creative Coding & Data Visualization** (Pre-college program, online)\* Summer 2021

## Introduction to Programming: Interactive Media (Pre-college program, online)\* Summer 2020

**Circuits, Robotics, and Arduino** (Pre-college program)\* Summer 2019

### Teaching Assistant (University of Massachusetts Amherst)

#### Advanced Methods in Human-Computer Interaction

Spring 2022, Spring 2021

#### Introduction to Social & Cultural Analytics

Spring 2021

### Introduction to Human-Computer Interaction

Fall 2020

### What's in the Box: How Computers Work

Fall 2019, Fall 2018, Fall 2017

#### Introduction to Programming with Python

Spring 2019

## Make: Physical Computing (Makerspace course)\* Spring 2018

## Pedagogical Workshops, Instructor

2022	"Tools for Cultivating Persistence in CS Education" Undergraduate Course Assistant Training Course, UMass Amherst
2021	"Less time Planning, More time Teaching" Teaching Academy, Graduate Student Orientation, UMass Amherst
2020	"Communicating with your Teaching Team" Teaching Academy, Graduate Student Orientation, UMass Amherst

# Pedagogical Training

2021	Essentials of Online Teaching, UMass Amherst 6-week course on how to develop and teach an online course, taught by the UMass Amherst Instructional Design, Engagement, & Support (IDEAS) team
2020	Online Faculty Development Course, UMass Amherst 4-week course on the instructional and technical aspects of online teaching, facilitated by the UMass Amherst Instructional Design, Engagement, & Support (IDEAS) team
2017	COMPSCI 879 Teaching Assistants as Tomorrow's Faculty, UMass Amherst Full-semester course to prepare Teaching Assistants (TAs) to fulfill their duties in an effective and pedagogically sound manner

# Mentorship

# Curriculum Development

2020	Developed tech resilience curricula as part of Microsoft's digital skills initiative. An article about this work and the final toolkit for educators is available here: https://inculture.microsoft.com/social-good/inclusion/tech-resilience/
2018	Assisted the CICS Diversity Committee in the creation of a new near-peer undergrad- uate mentorship program for underrepresented students in computing
2017	Developed course materials for Mount Holyoke College's Megas and Gigas Educate (MaGE) near-peer mentorship program

## Undergraduate Research Assistants

2022 - 2023	Ria Chawla (UMass Amherst)
2020 - 2023	Christiana Lee (UMass Amherst)
2020 - 2022	Thai On (UMass Amherst)
2020 - 2021	Rachel Shapiro (Northwestern University)
2019	Mackenzie Matscherz (UMass Amherst)

# **Direct Mentorship**

2021 - 2022	EMBER Research Mentor Led 4-week research apprenticeship for underrepresented undergraduates in computing
2020 - 2021	Stonewall Center Mentor Peer mentorship and support for LGBTQ+ UMass Amherst students
2020	PhD Applicant Support Program Mentor Reviewed application drafts of prospective underrepresented PhD students
2019	New Graduate Student Mentor Peer mentorship and support for new CICS PhD students

## Publications

Note: <u>Underlined</u> names correspond to undergraduate student authors.

Y Alyxander Burns, <u>Christiana Lee</u>, <u>Ria Chawla</u>, Evan Peck, and Narges Mahyar. "Who Do We Mean When We Talk About Visualization Novices?" In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (pp. 1-16). Best Paper Award (Top 1%)

Alyxander Burns, <u>Christiana Lee</u>, <u>Thai On</u>, Cindy Xiong, Evan Peck, and Narges Mahyar. "From Invisible to Visible: Impacts of Metadata in Communicative Data Visualization." To appear in *IEEE Transactions on Visualization and Computer Graphics*, 2022, 16 pages.

Alyxander Burns, <u>Thai On</u>, <u>Christiana Lee</u>, <u>Rachel Shapiro</u>, Cindy Xiong, and Narges Mahyar. "Making the Invisible Visible: Risks and benefits of disclosing metadata in visualization." 2021 IEEE Workshop on Visualization for Social Good (VIS4Good), 2021, pp. 11-15.

Alyxander Burns, Cindy Xiong, Steven Franconeri, Alberto Cairo, and Narges Mahyar. "Designing with pictographs: Envision topics without sacrificing understanding." *IEEE Transactions on Visualization and Computer Graphics*, vol. 28, no. 12, pp. 4515-4530, 2022.

Alyxander Burns, Cindy Xiong, Steven Franconeri, Alberto Cairo, and Narges Mahyar. "How to evaluate data visualizations across different levels of understanding." 2020 IEEE Workshop on Evaluation and Beyond - Methodological Approaches to Visualization (BELIV), 2020, pp. 19-28.

Andrew Cunningham, Alyxander Burns, and Narges Mahyar. "Looking to the past to visualize the present: Revisiting W.E.B. Du Bois' abolitionist visualizations." *Posters of IEEE VIS 2020*, 2020, 2 pages.

Alyxander Burns, Peter Klemperer, Jaemarie Solyst, and Audrey St John. "Redundant persistent acyclic formations for vision-based control of distributed multi-agent formations." In *Proceedings of the 31st Canadian Conference on Computational Geometry*, 2019, pp. 29-37.

Alyxander Burns, Bernd Schulze, and Audrey St John. "Persistent multi-robot formations with redundancy." In *Distributed Autonomous Robotic Systems*, 2018, pp. 133-146.

# Awards, Scholarships, and Fellowships

2023	Best Paper Award, ACM CHI 2023 Awarded to the top 1% of papers
2021 - 2022	Graduate Teaching Fellow, UMass Amherst Pedagogical training program to prepare PhD students in Computer Science to become course instructors
2021	Outstanding Reviewer – ACM CHI Recognized by area chair for providing high-quality reviews
2021	Scholarship to attend the CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference Awarded by the College of Information and Computer Sciences, UMass Amherst
2021	EMBER Mentorship Scholarship Awarded by the College of Information and Computer Sciences, UMass Amherst
2018	Robin Popplestone Fellowship in Robotics & Artificial Intelligence Awarded by the College of Information and Computer Sciences, UMass Amherst
2017	Phi Beta Kappa Scholar Inducted into Mount Holyoke College chapter

# **Conference Activity**

# **Paper Presentations**

2023	"Who Do We Mean When We Talk About Visualization Novices?" 2023 CHI Conference on Human Factors in Computing Systems
2022	"Designing with Pictographs: Envision Topics without Sacrificing Understanding" 2022 IEEE VIS (Invited Partner Talk)
2021	"Making the Invisible Visible: Risks and benefits of disclosing metadata in visualization" 2021 IEEE Workshop on Visualization for Social Good
2020	"How to evaluate data visualizations across different levels of understanding" 2020 IEEE Workshop on Evaluation and Beyond – Methodological Approaches to Visualization
2016	"Persistent multi-robot formations with redundancy" 2016 IEEE International Symposium on Distributed Autonomous Robotic Systems

# Invited Talks and Workshops

2020	"Looking to the Past to Visualize the Present: Revisiting W.E.B. Du Bois' Abolitionist Visualizations" CICS Community Discussion on Antiracism, UMass Amherst
Fall 2019	"The Art of Coding" Summer Programs Pre-College Preview, UMass Amherst Mount Ida Campus

# Service

# Institutional Service

## Mount Holyoke College

2022 - 2023	AI4All On-Campus	Program	Liaison
2022 2020	minin on campus	1 10gram	Liabon

### University of Massachusetts Amherst

2021 - 2022	Committee Member, Teaching Development Committee
2020 - 2021	Committee Member, CICS Committees Against Racism and for Equality (CARE) – Faculty Teaching Incorporated into the Teaching Development Committee in Fall 2021
2018 - 2020	Volunteer, PhD Candidate Friday

## **Professional Service**

2020 - 2023	Reviewer, IEEE VIS
2021	Reviewer, ACM CHI
2020 - 2021	Student Volunteer, IEEE VIS
2021	Reviewer, alt.VIS
2021	Reviewer, ACM Creativity & Cognition

# **Community Outreach**

2017 - 2019	Eureka! Creative Computing Workshop Mentor, Girls Inc. of Holyoke
2017 - 2019	Panelist, "The Graduate School Option," Mount Holyoke College