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Computer Science Department  
University of Illinois at Urbana-Champaign

# Zhilin Zhang

## RESEARCH INTERESTS

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My research interests are in Human-Computer Interaction and Learning Sciences. I study, design, and build intelligent systems to support scalable and accessible teaching and learning through a computational lens.

- Human-Computer Interaction, Learning Sciences and Technologies
- Social Computing, Crowdsourcing, Human-Centered AI

## EDUCATION

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2017 - 2021    **University of Illinois at Urbana-Champaign (UIUC), Urbana, IL**  
5-Year B.S.-M.S. in Computer Science (with thesis)  
Advisors: Lawrence Angrave and Karrie Karahalios

## RESEARCH EXPERIENCES

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2019.05 - present    **Research Assistant, University of Illinois at Urbana-Champaign, Urbana, IL**

### **ClassTranscribe Team**

Faculty Supervisor: Lawrence Angrave

#### - **ClassTranscribe**

ClassTranscribe is a Microsoft sponsored online learning platform. I analyzed behavioral data of 1,895 users totaling more than 5,000,000 interactions with the system to study students' attitudes and behaviors towards caption-based video search. The results have been published at SIGCSE [2] and ASEE [3, 7].

### **Social Spaces Group**

Faculty Supervisor: Karrie Karahalios

#### - **AI Autograder**

I used a grounded-theory approach to code the qualitative data from a 22-participant interview study. The results provided insights into students' folk theories, interaction strategies, perceived accuracy, satisfaction and fairness towards the AI grading system. The paper [4] has been published at CHI 2021.

### **Text Information Management and Analysis (TIMAN) Group**

Faculty Supervisor: ChengXiang Zhai

- **Learnersourcing STEM Caption Editing**

I came up with the original research idea of this project, pulled together the team, prepared the IRB, designed and conducted the in-class activity, created the survey and interview protocols, conducted and analyzed the semi-structured interviews. Our team investigated learnersourcing as a way to advance caption editing in video-based online learning (especially for STEM courses). The paper [8] is in submission at CSCW 2021.

### **Strategic Instructional Innovations Program (SIIP) Team**

Faculty Supervisors: Lawrence Angrave, Hongye Liu, Jenny Amos

- **Large-Scale Student Survey**

I conducted the interviews and wrote the first draft of the paper. We conducted survey and interview across several large courses in engineering and computing at UIUC to identify course components that engage students with and without disabilities. We were motivated to find not only opportunities for future course improvements for all students but also greater equity for students with disabilities. The paper [6] has been accepted by ASEE 2021.

### **Social Computing Systems Lab**

Faculty Supervisor: Yang Wang

- **WebAlly**

I led the design and implementation of a 20-participant user study on an integrated friend-sourcing tool that helps visually impaired people with inaccessible web tasks. The user study investigated users' attitudes towards the tool, regarding friend-sourcing vs. crowd-sourcing, paid vs unpaid, privacy concerns, and impacts on their relationship. The paper [5] has been accepted by SOUPS 2021.

### **Data Driven Design Group**

Faculty Supervisor: Ranjitha Kumar

- **On-Device Interaction Mining**

I designed and developed an Android app using the Android Accessibility Service to automatically record users' interactions with other apps on the phone. The logged data include gestures, screenshots, and view hierarchies. We are using the data to mine user habits and generate task shortcuts.

- **Privacy Probe**

I used the ZIPT system to collect and analyze data from 20 participants on their opinions regarding privacy concerns over popular mobile apps (Facebook, Amazon, Chase, etc.) The results shed light on mobile users' privacy concerns beyond their personally identifiable information (PII).

## PUBLICATIONS

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(\* = Equal Contribution)

### CONFERENCE PAPERS

- [8] Bhavya, Si Chen, **Zhilin Zhang**, Tiffany Wenting Li, ChengXiang Zhai, Lawrence Angrave, Yun Huang. Advancing Learnersourced Caption Editing for Video-Based STEM Education. (In Submission at CSCW 2021)
- [7] **Zhilin Zhang\***, Bhavya\*, Lawrence Angrave, Ruihua Sui, Chirantan Mahipal, Rob Kooper. How Students Search Video Captions to Learn: An Analysis of Search Terms and Behavioral Timing Data. In Proceedings of the ASEE Annual Conference and Exposition. (ASEE 2021)
- [6] Jenny Amos\*, **Zhilin Zhang\***, Lawrence Angrave\*, Hongye Liu\*, Yiyin Shen, Kusum Vanwani. A UDL-based large-scale study on the needs of students with disabilities in engineering courses. In Proceedings of the ASEE Annual Conference and Exposition. (ASEE 2021)
- [5] Zhuohao Zhang, **Zhilin Zhang**, Haolin Yuan, Natã Barbosa, Sauvik Das, Yang Wang. WebAlly: Making Visual Task-based CAPTCHAs Transferable for People with Visual Impairments. In Proceedings of the Symposium on Usable Privacy and Security. (SOUPS 2021)
- [4] Silas Hsu\*, Tiffany Wenting Li\*, **Zhilin Zhang**, Max Fowler, Craig Zilles, Karrie Karahalios. Attitudes Surrounding an Imperfect AI Autograder. In Proceedings of the ACM Conference on Human Factors in Computing Systems. (CHI 2021)
- [3] Lawrence Angrave, Karin Jensen, **Zhilin Zhang**, Chirantan Mahipal, David Mussulman, Christopher Schmitz, Robert Baird, Hongye Liu, Ruihua Sui, Maryalice Wu, and Rob Kooper. 2020. Improving Student Accessibility, Equity, Course Performance, and Lab Skills: How Introduction of ClassTranscribe is Changing Engineering Education. In Proceedings of the ASEE Annual Conference and Exposition. (ASEE 2020)  
**Best Diversity, Equity & Inclusion Paper Honorable Mention**
- [2] Lawrence Angrave, **Zhilin Zhang**, Genevieve Henricks-Lepp, and Chirantan Mahipal. 2020. Who Benefits? Positive Learner Outcomes from Behavioral Analytics of Online Lecture Video Viewing using ClassTranscribe. In Proceedings of the ACM Symposium on Computer Science Education. (SIGCSE 2020)
- [1] **Zhilin Zhang**. What Benefits? Exploring the Influences of Student Behaviors in an Online Video Class. (Senior Thesis, 2020)

## TALKS & PANELS

- [t.1] **Zhilin Zhang**, Lawrence Angrave. 2020. ClassTranscribe: Addressing the COVID Challenge and Promoting Better Equity in Education. In Computing Research Association (CRA) Virtual Conference 2020.

## ARCHIVED PAPERS

- [a.1] **Zhilin Zhang**, Lawrence Angrave, Patrick Lin, Ian Ludden. A Study of ClassTranscribe, a UDL Tool: Attitudes, Behaviors, and Learning Outcomes in an Online Discrete Math Course.

## TEACHING EXPERIENCES

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	<b>University of Illinois at Urbana-Champaign, Urbana, IL</b>
Spring 2021	Teaching Assistant, CS 225: Data Structures
Fall 2020	Teaching Assistant, CS 410: Text Information Systems
Spring 2020	Course Assistant, CS 498: Art and Science of Web Programming
Fall 2017	Course Assistant, CS 125: Intro to Computer Science

## AWARDS & HONORS

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2020	<b>Best Diversity, Equity &amp; Inclusion Paper Honorable Mention</b> American Society for Engineering Education
2017 - 2020	<b>Dean's List</b> Grainger College of Engineering, UIUC
2018 - present	<b>TAU BETA PI</b> the Engineering Honor Society

## SERVICE

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**Reviewer:** SIGCSE 2021

## SKILLS

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### UIUC COURSEWORKS

- Applied Machine Learning, Text Retrieval and Mining
- Art and Science of Web Programming
- Human-Computer Interaction, Experimental Methods for HCI
- Virtual Reality, Social Spaces on the Internet
- Database Systems, Distributed Systems, System Programming
- Data Structures and Algorithms, Computer Architectures

**TECHNOLOGIES**

- Java, C / C++, Python, C#, MIPS, Haskell, etc.
- JavaScript, HTML5, CSS3, React.js, Node.js, SQL(MySQL)/NoSQL(MongoDB)
- Web and Mobile (Android) Development
- VR Frameworks, Unity