

# Xiaoyi Tian

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## RESEARCH INTERESTS

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Artificial Intelligence Education, Human-Centered Design, Computational Linguistics, Learning Analytics

## SKILLS

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**User-Centered Research:** Contextual inquiry, interview, survey, storyboard, usability testing, persona, qualitative coding, dialogue act tagging, ethnography, case study

**Statistical Analysis:** R, SPSS, JMP, Stata

**Programming Languages and Frameworks:** Python, HTML, CSS, Bootstrap, Javascript, Java, C, VB, SQL, MATLAB, Blazor, React, Blockly

## EDUCATION

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<b>Ph.D. in Human-Centered Computing</b>	2020 - present
University of Florida	Gainesville, FL

<b>M.S. in Information Science</b>	2018 - 2020
University of Pittsburgh	Pittsburgh, PA

<b>B.Mgmt. in Management Science</b>	2014 - 2018
Anhui University	Hefei, China

## EXPERIENCE

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<b>Graduate Research Assistant</b>   Advisor: Kristy Boyer	08/2020 - present
LearnDialogue Lab, University of Florida	Gainesville, FL

- Designed and developed a conversational AI development environment: *AMBY*, featuring youth-centered visual elements, AI conceptual scaffolding and dual input modalities (text and speech) for middle school students
- Conducted contextual inquiry and usability studies with 46 youth (aged 12-13) and 11 adults to understand user experiences and challenges while using *AMBY*. The analysis contributes design implications for conversational AI authoring tools that empower AI learning for youth.
- Clustered affective states and problem-solving behaviors of 86 undergraduate students in an adaptive block-based programming environment for novice learners. This study provided insight into how frustration trajectory models can guide system adaptivity during problem-solving episodes.
- Modeled linguistic alignment and its relationship with satisfaction outcome in collaborative programming dialogues using Bayesian mixed-effect models

<b>Research Intern</b>   Supervisors: Amy Ogan, Michael Madaio	10/2019 - 07/2020
Human-Computer Interaction Institute, Carnegie Mellon University	Pittsburgh, PA

- Automated data collection for a child literacy system used by 500+ participants in Côte d'Ivoire over 8 months
- Visualized user phonological awareness curriculum progression of 8 units and 1,000+ weekly logs of learning actions

<b>Research Assistant</b>   Supervisor: Erin Walker	04/2019 - 05/2020
Facet Lab, University of Pittsburgh	Pittsburgh, PA

- Conducted qualitative research on multi-sessions rapport management of middle school learners with a social robot
- Utilized Independent Component Analysis (ICA) to model linguistic rapport components extracted from human coding and automated LIWC measurements

## PROJECTS

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**Automatically Assessing Open-ended AI Projects using LLMs** | Individual research 7/2023 - present

Developing a large language model (LLM)-based automatic evaluator to streamline the open-ended project evaluation and offer immediate feedback for students to adjust and improve their projects.

- Developed the conversational AI project evaluation rubric focusing on assessing four aspects of student artifacts: project ideation, AI development, conversational design and end-user satisfaction
- Generated synthetic dialogue systems dataset using LLMs
- Experimented different prompting strategies to improve the evaluation accuracy

**Linguistic Alignment in Collaborative Learning Dialogues** | Course project (lead) at UF 01/2021 - present

Research on the role of linguistic alignment in middle school students collaborative problem solving dialogues

- Parsed the syntactic structure and extracted lexical types for both task-relevant and non-task words
- Calculated linguistic alignment on both syntax level and lexicon level for each dialogue exchange
- Performed Bayesian mixed-effect modeling on linguistic alignment and students' satisfaction toward their partner

**StudyBuddy: a Chatbot for Effective Study Habits** | Collaborative project (lead) at Pitt 09/2019 - 10/2020

Designing a chatbot prototype to induce and sustain study behavioral change for university first-year students

- Utilized mix-method to investigate the feasibility of chatbots for study behavioral change of college students
- Formed design inquiry by interviewing with 3 peer tutors and surveying 87 freshmen
- Developed a chatbot prototype in Slack using DialogFlow and Slack API
- Conducted in-depth interviews with 8 students, 5 faculty and a usability survey with 118 students
- Offered design recommendations for chatbots on building trust with users, incorporating gender and individual differences, importance of context, balancing between immediate help and long-term support

## AWARDS AND HONORS

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<b>Gartner Group Graduate Fellowship</b> , University of Florida	2022, 2023
<b>Outstanding Undergraduate Thesis (Top 1% in the Class)</b> , Anhui University	2018
<b>Academic Excellence Scholarship</b> , Anhui University	2015 & 2016 & 2017
<b>"Merit Student"</b> , Anhui University	2015 & 2017

## PUBLICATIONS ([GOOGLE SCHOLAR PAGE](#))

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### Journal Articles

- J3 **AMBY: A Development Environment for Youth to Create Conversational Agents**  
Xiaoyi Tian, Amit Kumar, Carly E Solomon, Kaceja D Calder, Gloria Ashiya Katuka, Yukyeong Song, Mehmet Celepkolu, Lydia Pezzullo, Joanne Barrett, Kristy Elizabeth Boyer, Maya Israel.  
*International Journal of Child-Computer Interaction*. In press.
- J2 **Let's Talk It Out: A Chatbot for Effective Study Habit Behavioral Change**  
Xiaoyi Tian, Zak Risha, Ishrat Ahmed, Arun Balajiee Lekshmi Narayanan, Jacob Biehl.  
*Proceedings of the ACM on Human-Computer Interaction*. 5, CSCW1. April. 2021.
- J1 **Online Educational Information Quality Modeling and Perceived Difference Comparison**  
Xiaoyi Tian, Jing Li, Qin Yu.  
In *Journal of Hefei Normal University*. 2016, 34(5).

### Conference Papers

- C8 **Artificial Intelligence Unplugged: Designing Unplugged Activities for a Conversational AI Summer Camp**  
Yukyeong Song, Xiaoyi Tian, Nandika Regatti, Gloria Ashiya Katuka, Kristy Elizabeth Boyer and Maya Israel  
*Proceedings of the 55th ACM Technical Symposium on Computer Science Education (SIGCSE)*. March. 2024.
- C7 **Are We on the Same Page? Modeling Linguistic Synchrony and Math Literacy in Mathematical Discussions** **[Best Short Paper Award]**  
Yukyeong Song, Wanli Xing, Xiaoyi Tian and Chenglu Li  
*13th International Learning Analytics and Knowledge Conference (LAK)*. March. 2023.

- C6 A Summer Camp Experience to Engage Middle School Learners in AI through Conversational App Development [Best Paper Award]**  
 Gloria Ashiya Katuka, Yvonika Auguste, Yukyeong Song, Xiaoyi Tian, Amit Kumar, Mehmet Celepkolu, Kristy Elizabeth Boyer, Joanne Barrett, Maya Israel, Tom McKlin.  
*Proceedings of the 54th ACM Technical Symposium on Computer Science Education (SIGCSE)*. March. 2023.
- C5 AI Made By Youth: A Conversational AI Curriculum for Middle School Summer Camps**  
 Yukyeong Song, Gloria Ashiya Katuka, Joanne Barrett, Xiaoyi Tian, Amit Kumar, Tom McKlin, Mehmet Celepkolu, Maya Israel and Kristy Elizabeth Boyer  
*The Thirteenth Symposium on Educational Advances in Artificial Intelligence (EAAI)*. February. 2023.
- C4 Applying Cognitive Load Theory to Examine STEM Undergraduate Students' Experiences in An Adaptive Learning Environment: A Mixed-Methods Study**  
 Dolly Bounajim, Arif Rachmatullah, Madeline Hinckle, Bradford Mott, James Lester, Andy Smith, Andrew Emerson, Fahmid Morshed Fahid, Xiaoyi Tian, Joseph B Wiggins, Kristy Elizabeth Boyer, Eric Wiebe.  
*Proceedings of the Human Factors and Ergonomics Society Annual Meeting*. October. 2021.
- C3 Modeling Frustration Trajectories and Problem-Solving Behaviors in Adaptive Learning Environments for Introductory Computer Science**  
Xiaoyi Tian, Joseph B. Wiggins, Fahmid Morshed Fahid, Andrew Emerson, Dolly Bounajim, Andy Smith, Kristy Elizabeth Boyer, Eric Wiebe, Bradford Mott, James Lester.  
*Proceedings of International Conference on Artificial Intelligence in Education (AIED)*. July. 2021.
- C2 Progression Trajectory-Based Student Modeling for Novice Block-Based Programming**  
 Fahmid Morshed Fahid, Xiaoyi Tian, Andrew Emerson, Joseph B. Wiggins, Dolly Bounajim, Andy Smith, Eric Wiebe, Bradford Mott, Kristy Elizabeth Boyer, James Lester.  
*Proceedings of the 29th ACM Conference on User Modeling, Adaptation and Personalization (UMAP)*. July. 2021.
- C1 Understanding Rapport over Multiple Sessions with a Social, Teachable Robot**  
Xiaoyi Tian, Nichola Lubold, Leah Friedman, Erin Walker.  
*Proceedings of International Conference on Artificial Intelligence in Education (AIED)*. July. 2020.

#### Workshop Papers and Posters

- W3 Guide, Safety Net, Project Tester, and More: Investigating the Roles of Facilitators in an Artificial Intelligence Summer Camp**  
 Yukyeong Song, Xiaoyi Tian, Joanne Barrett, Maya Israel, Kristy Elizabeth Boyer.  
*Poster in International Conference of the Learning Sciences (ICLS 2023)*. June. 2023.
- W2 Early Design of a Conversational AI Development Platform for Middle Schoolers**  
 Amit Kumar, Xiaoyi Tian, Mehmet Celepkolu, Maya Israel, Kristy Elizabeth Boyer.  
*Poster in 2022 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*. September. 2022.
- W1 Dominance as an Indicator of Rapport and Learning in Human-Agent Communication**  
 Amanda Buddemeyer, Xiaoyi Tian, Erin Walker.  
*Student Research Workshop in Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics (ACL)*. July. 2020.

#### ACADEMIC AND COMMUNITY SERVICES

Microsoft TEALS volunteer, teacher for high school computer science (CS1, Python)	08/2022 - 12/2022
Reviewer of ACM Transactions on Computing Education (TOCE)	
Reviewer of ACM Technical Symposium on Computer Science Education (SIGCSE TS) 2024	
PC Member of International Society of the Learning Sciences (ISLS) 2023	
Reviewer of ACM CHI Conference on Human Factors in Computing Systems (CHI) 2023, 2024	
Reviewer of International Conference on Educational Data Mining (EDM) 2022	
Reviewer of ACM Conference on Computer-Supported Cooperative Work (CSCW) 2020, 2023	

#### INVITED TALKS AND SEMINARS

<b>Guest speaker of PAWS Research Seminar</b> , University of Pittsburgh <i>Learner Modeling and Design of CS &amp; AI Learning Environments</i>	04/2023
<b>Guest speaker of AI workshop for Florida middle school teachers</b> , University of Florida <i>Camp DIALOGS: Teaching Conversational AI in Middle School Summer Camps</i>	07/2022

**Guest speaker of undergraduate HCI course, University of Florida**

03/2021

*Let's talk it out: A chatbot for effective study behavioral change*

*Last update: 10/16/2023*