Adv. Topics in Conversational User Interface
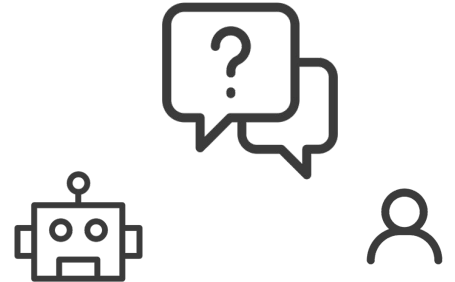
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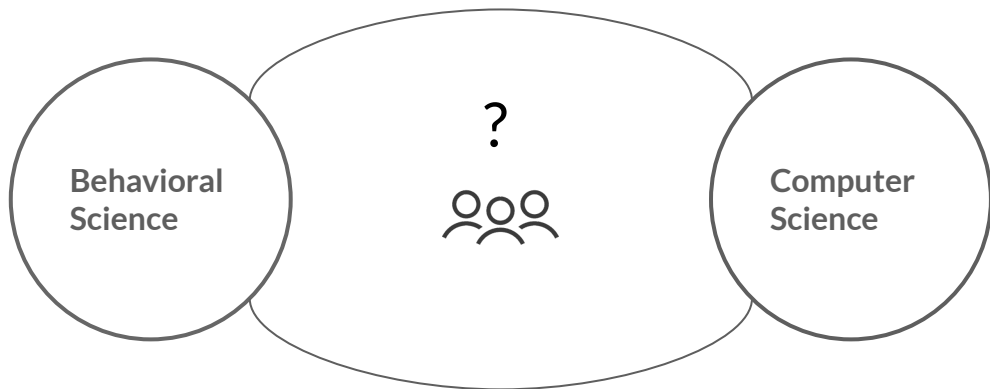
Ziang Xiao

Department of Computer Science

Spring 2024

About me

Behavioral Science

?

Computer Science

Research Directions

Context

Agency

Time span

- AI for Social Science Discovery
- Robust and Contextualized Evaluation Methods
- Power Dynamics in Human-AI Interaction
- Proactive and Lifelong AI agents

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JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

TA: Leo Du (ldu10@jhu.edu)

Course Info:

- 3 pm - 4:15 pm Mon. / Wed.
- Hodson 211
- In person

Course Logistics

- Explore the cutting edge research of the HCI side of Conversational AI

- Engage thoughtful discussion on emerging topics of conversational user interface

- Complete a novel and rigours group project related to conversational user interface

Course Goals

- Conversational User Interface Basics

- LLMs and CUI

- Evaluation

- Human Agency in CUI

- Emerging Topics

Course Topics

Course Structure

- Announcement (if any)

- Paper Presentation (Two papers/ ~20 min total)

- Discussion in groups (~25 min)

- Discussion as a class (~15 min)

- A short lecture to cover next class's topic (~10-15 min)

Discussion Format

- For each class, you will be randomly assigned into a group w/ 4-5 students.

- The group announcement will be made prior to the class.

  - A lead discussant will be appointed

  - Other group members should coordinate and each choose a different role

- The lead discussant should read everyone's response prior to the class, they will lead and organize the discussion and synthesize for reporting back to the whole class.

- Given the hat you wear, you will participate the discussion from a unique perspective on the class topic and assigned readings.

Roles

👩🏽‍🔬 **Scientific Reviewer.** The paper has not been published yet and is currently submitted to a top venue where you've been assigned as a peer reviewer.

🏺 **Archaeologist.** This paper was found buried under ground in the desert. You're an archeologist who must determine where this paper sits in the context of previous and subsequent work. Find and report on one *older* paper cited within the current paper that substantially influenced the current paper and one *newer* paper that cites this current paper.

🍜 **Academic Researcher.** You're a researcher who is working on a new project in this area. Propose an imaginary follow-up project *not just* based on the current but only possible due to the existence and success of the current paper.

Roles

💰 **Industry Practitioner.** You work at a company or organization developing an application or product of your choice. Bring a convincing pitch for why you should be paid to implement the method in the paper, and discuss at least one positive and negative impact of this application.

🕵️ **Private Investigator.** You are a detective who needs to run a background check on one of the paper's authors. Where have they worked? What did they study? What previous projects might have led to working on this one? What motivated them to work on this project? Feel free to contact the authors, but remember to be courteous, polite, and on-topic.

🌎 **Social Impact Assessor.** Identify how this paper self-assesses its (likely positive) impact on the world. Have any additional positive social impacts left out? What are possible negative social impacts that were overlooked or omitted?

Course Project
(More details TBA)

- Group project with 3-4 students
- Topics related to CUI
- Project Scope
  - System
  - Study
  - Analytics
  - Or anything if you think is suitable (we can discuss)

Anonymous Feedback Form

- 3 times per semester
- What I want to know
    - What do you want to change?
    - What other topics do you want to learn?
    - Any suggestions it make it a better course

- Reading responses (15%)
- Class Engagement (30%)
  - Class presentation (10%)
  - Class lead discussant (10%)
  - Discussion participation (10%)
- Project (50%)
  - Project literature review (10%)
  - Project written proposal and presentation (15%)
  - Project final presentation and paper (25%)
- Anonymous course feedback (5%)
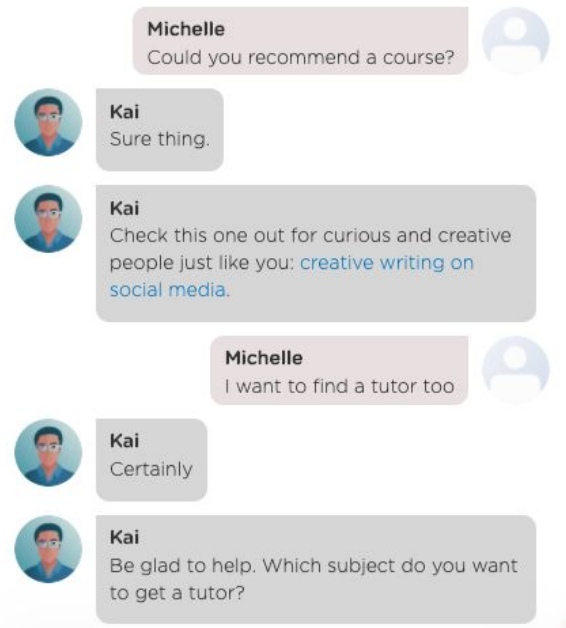
Grading

Who are you?

- Your name
- Your major
- A fun fact about you
- What's your experience with conversational agents?
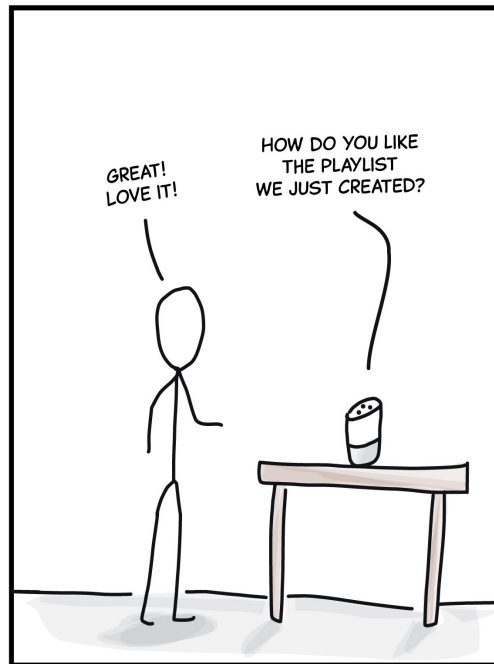
What is AI?

Conversational User Interface

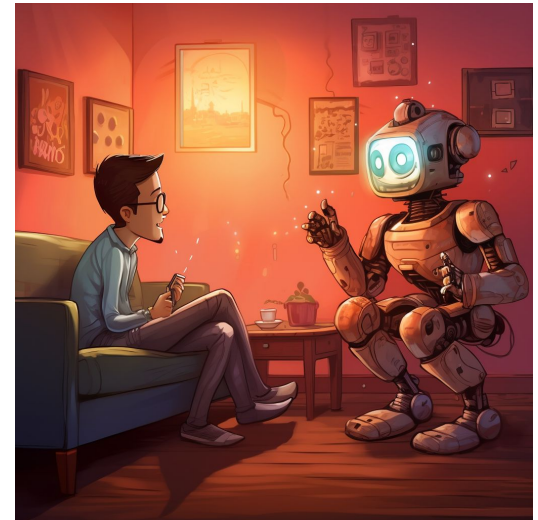History and Evolution

Who has had a conversation with a machine?

Chatbots

Voice assistants

Embodied agents

What is Conversational UI?

Conversational UI is technology that enables humans and computers to communicate clearly and effectively through natural language.

A new way to interact with computers

Command Line — **Graphical Interface** — **Natural Language Interface**

Why do we want conversational UI?

The **user** perspective

- More intuitive, enabling people to use the most natural means of communication

- More engaging, the system response is more expressive

- Faster, enable users to complete certain tasks faster than by using a GUI

The **industry** perspective

- Improved user experience

- Enable new products

- More personalized interaction with technology

- Reduced costs

The **research** perspective

- Basic and applied research on social interaction and communication need

- New design language needed to implement this new type of interface

- How to build new tools for more robust/advanced speech processing

- New ethical and legal frameworks needed to regulate this powerful new and potentially invasive technology

Milestones

ELIZA

provide a parody of "the responses of a non-directional psychotherapist in an initial psychiatric interview" and to "demonstrate that the communication between man and machine was superficial".

Amazon Alexa

capable of voice interaction, music playback, making to-do lists, setting alarms, streaming podcasts, playing audiobooks, and providing weather, traffic, sports, and other real-time information, such as news.

ChatGPT

a conversational AI using deep learning for generating human-like responses, enabling interactive, dynamic, and context-aware conversations with users.

2011

2022

2023

1964

2014

2022

IBM Watson

a question-answering computer system capable of answering questions posed in natural language

Cicero

the first AI to play at a human level in Diplomacy, a strategy game that requires building trust, negotiating and cooperating with multiple players.

BingChat

the search engine uses conversational AI technologies to enhance user experience and understand user queries.

See you on Wednesday!