# CS 377Q: Today's goals

- User study case study
- Revised prototype review

# Stanford Disability Studies Conference

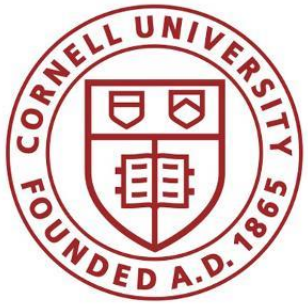
Saturday, May 18
A3C Ballroom

https://stanforddisabilityconference.wordpress.com/

# Accessible Video Calling: Enabling Nonvisual Perception of Visual Conversation Cues

Lei Shi*, Brianna J. Tomlinson†, John Tang, Edward Cutrell, Daniel McDuff, Gina Venolia, Paul Johns, Kael Rowan

Microsoft Research, *Cornell University, †Georgia Institute of Technology


# The Problem

Non-verbal visual cues play a large role in human communication

People who are blind or low vision may not have access to these cues during conversations

How can we detect and provide these cues to someone who is blind or low vision to support everyday interactions, such as conversations in a video call?

# Research Questions

- Can we use AI to detect non-verbal, visual, interactional cues?
  - Nodding head in agreement
  - Shaking head in disagreement
  - Wanting to say something
- Can we convey interactional cues to the Visually Impaired?
  - Leveraging soundtrack associations with human reactions

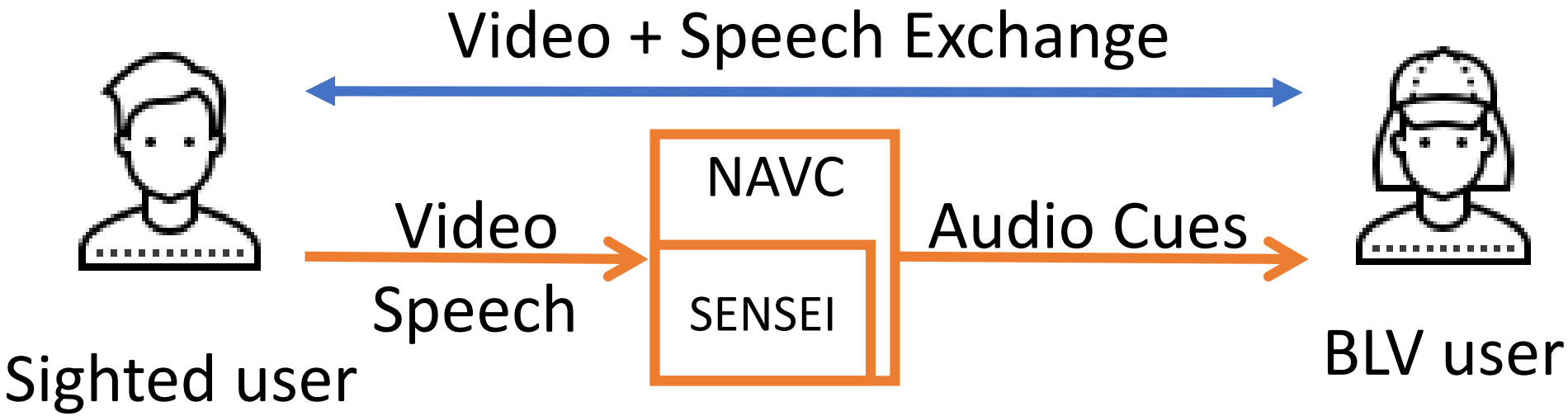
# Formative User Research

- 26 interview (16 female, 10 male)
- Describe recent, substantive conversation with sighted person
- What conversational cues were important
- Wizard of Oz demo of concept

# Design Reviews

- Partner with agencies that serve blind and low vision community
  - Skills training
  - Technology development
- People who were blind or low vision, and advocates for the community
- Design reviews of prototype along the way
- One approach for dealing with scarcity of user population

# Nonvisually Accessible Video Calling (NAVC)




A system that enables people who are Blind or Low Vision to *hear* visual information from video calls without any added equipment

# User Study Methodology

- 18 people with VI
- 12-15 min conversations with 2 confederates
  - Same 2 discussion partners across all sessions
- Conversation topics:
  - Giving advice for traveling to a city (food, places to visit)
  - Talking about shared likes and dislikes
- Conditions
  - Video call
  - Video call + NAVC

# Data collection

- Choose a condition for another conversation (A/B, Choice)
  - What are the reasons you chose this option?
- Rank order the usefulness of audio cues
- Usability and audio UX ratings (Likert scale)
  - It was easy to match the sounds to their meanings.
  - It was confusing to remember which sounds meant which gesture.
- Trying to evaluate utility
  - Which person was easier to talk to?
    - What are the reasons you chose this person
  - For which of the conversation partners was it easier to understand their preferences?
- Methodological challenge: Directly asking about evaluating prototype

# Findings

- People wanted more time to learn the audio signals
- 8 people each chose NAVC or video calling for another call
- People liked the attention sound (ranked it as most useful, most distinguishable)
- Increased accuracy is important (especially avoiding false positives)
- More exploration of audio design (more ambient sounds)

# User response

- P210: *The more the sounds occurred, the easier they were to associate with the emotional state, the facial expression*
- P212: *Initially, looking at camera made really good sense. Nod made sense, Disagree made sense, the rest didn't seem different. Want them to be really different from first two and from each other*
- P211: *Definitely in conversations with people that I've never met before, don't really know anything about, don't know as much about how they feel about things or their reactions to things it would be helpful.*
- P215: *I think for like work, I would definitely use it, because I have no idea what people are thinking. …it's really hard to read what they really think.*
- P202: *I wasn't really in the conversation 'cause I was trying to pay attention to the sounds. But I think after using it after a while, and I get adapted to like, … without thinking basically what the sounds mean, I think it would go like a lot smoother.*

# Thursday prototype user study review (5/16)

- Work through the user study task with the revised prototype
- 10-minute slot
- Not graded, but will give more feedback on the revised prototype and the user study task
- Trijeet and John will circulate independently
  - Trijeet will focus on prototyping issues
  - John will focus on user study issues

# When not talking with teaching team

- Each person complete following forms:
  - https://tinyurl.com/CS377QProtoReflect reflecting on the prototype development and user study process so far
  - https://tinyurl.com/CS377QMidFeedback to give us anonymous feedback on the class