Social Tensions with HMDs for Accessibility

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HUMAN CENTERED
DESIGN & ENGINEERING

inclusive
design lab

DUB

Photo via Jain et al., DIS 2018, ASSETS 2018

About Me

- First year Ph.D. student

- Advised by Dr. Leah Findlater

- B.S. in math from Minnesota

- Prior work in e-textiles

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HUMAN CENTERED DESIGN & ENGINEERING

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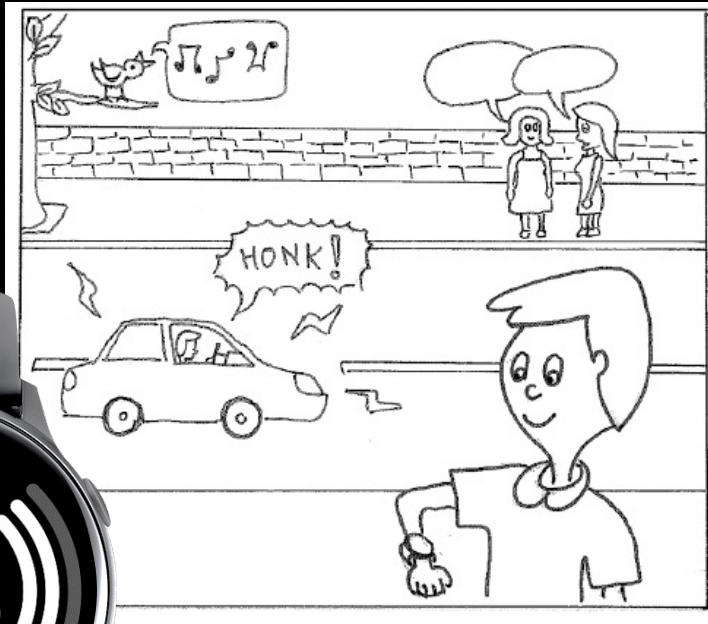
inclusive design lab
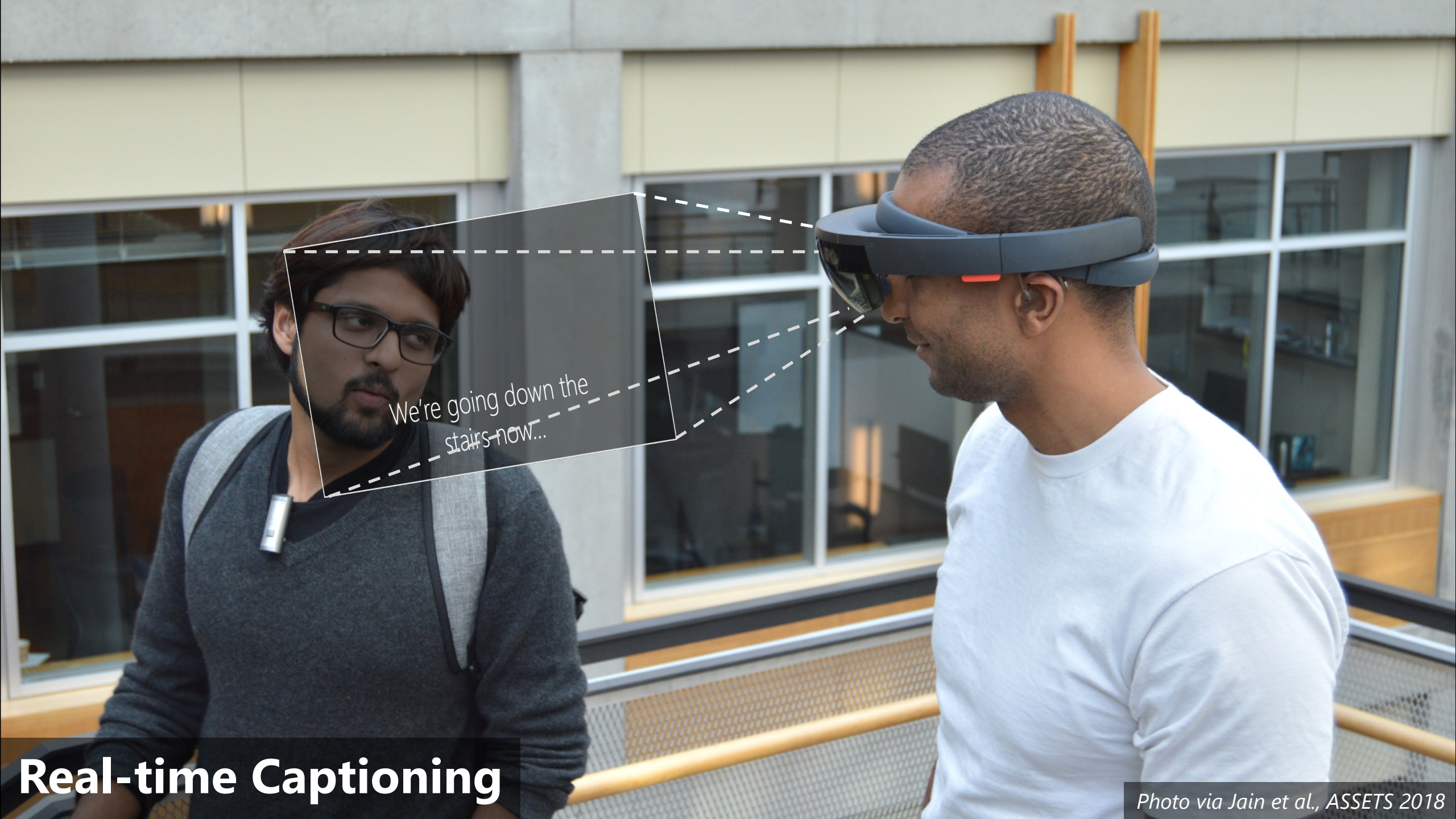
Photo via Univ. of Washington

Research Interests

- **Wearable assistive devices**

- Considering needs and preferences

- Inclusive development process

Wearable Sound Sensing and Feedback

Social Tensions with HMDs for Accessibility

Real-time Captioning

We're going down the stairs now...

Augmenting Vision

Vocabulary Support

HMDs as Assistive Technology
Key Social Challenges

1. Perception and Stigma

2. Effective Communication

3. Sensing and Privacy

Key Social Challenges

1. **Perception and Stigma**

2. Effective Communication

3. Sensing and Privacy

Public resistance to HMDs   **Stigmatization of Assistive Tech**
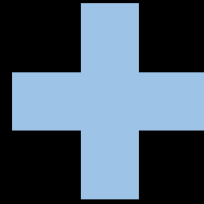
Photos via Youtube, The Guardian
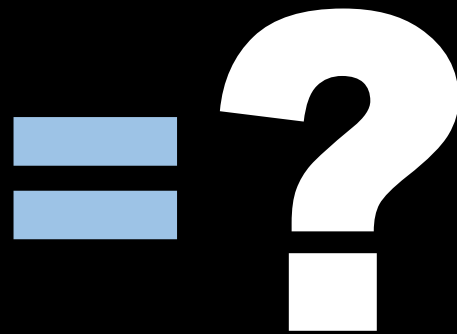
Disability Affects Perception

With assistive accessories

vs.

No indications of disability

Higher social acceptability

Photo via Profita, et al., CHI 2016

How to disclose the assistive purpose of an HMD responsibly?

Given individuals with disabilities may be sensitive to unwanted attention

Key Social Challenges

1. Perception and Stigma

2. Effective Communication
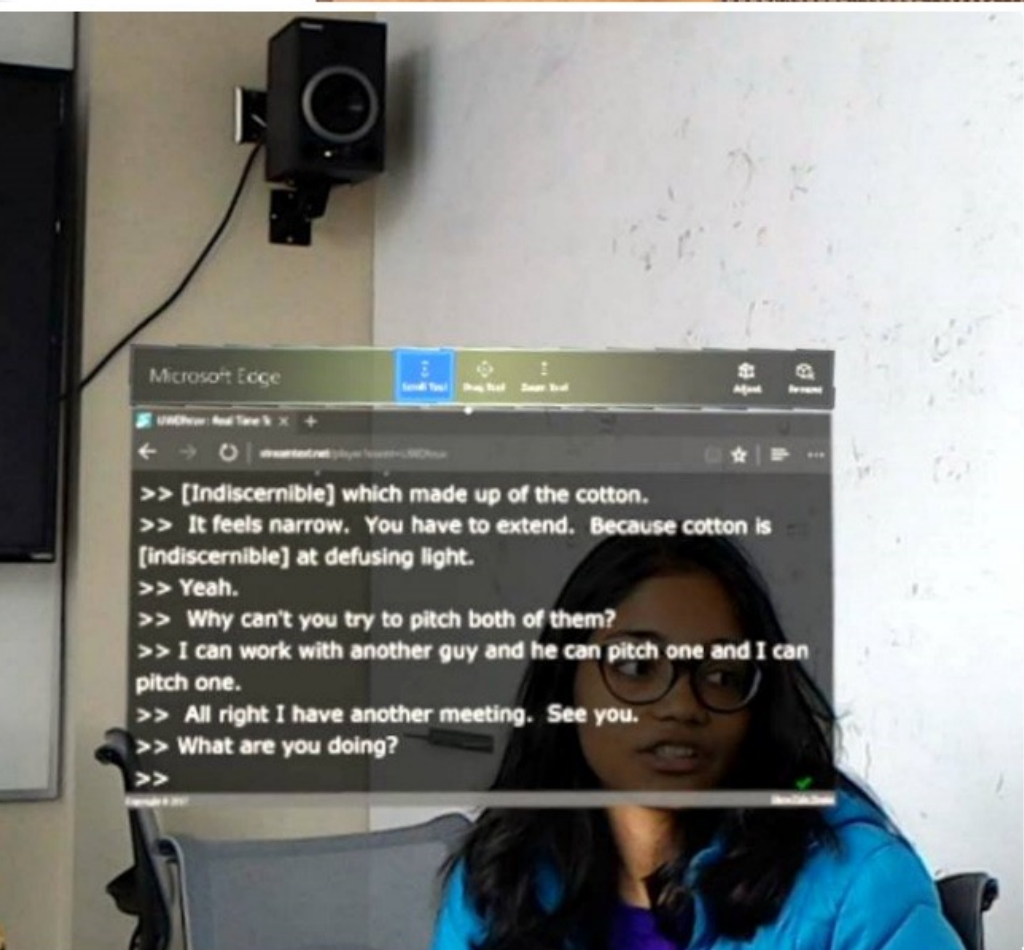
3. Sensing and Privacy

Real-time Captioning

Photo via Jain, et al., ASSETS 2018
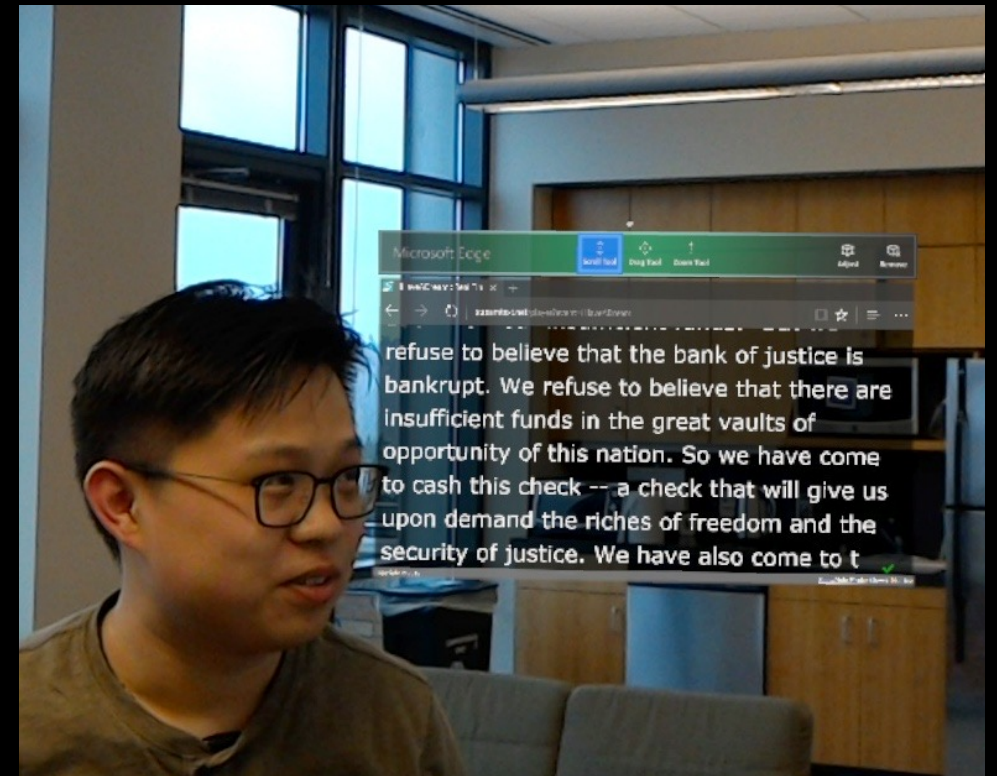
Sound Source Location

Communication Challenges

- High cognitive effort

- Obscured facial expressions

- Burden of adapting

Communication Challenges

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Communication Challenges

- High cognitive effort

- **Obscured facial expressions**

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Photo via Stearns et al., ASSETS 2018

Communication Challenges

- High cognitive effort

- Obscured facial expressions

- **Burden of adapting**

How do we address these issues?

- High cognitive effort

- Obscured facial expressions

- **Burden of adapting**

Photo via Jain et al., ASSETS 2018

Key Social Challenges

1. Perception and Stigma

2. Effective Communication

3. **Sensing and Privacy**

It's really nice to see you.

Hello, how have you been?
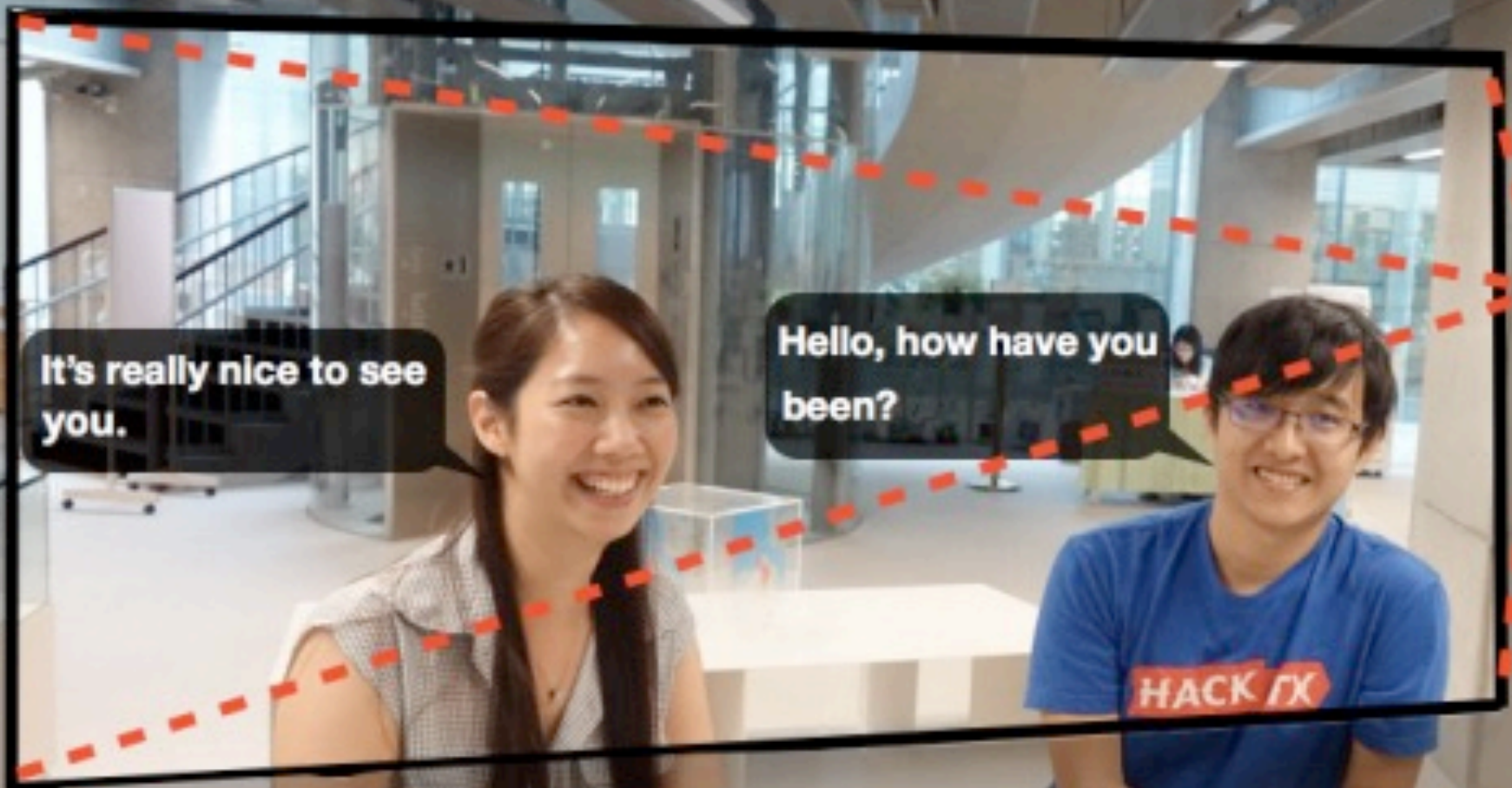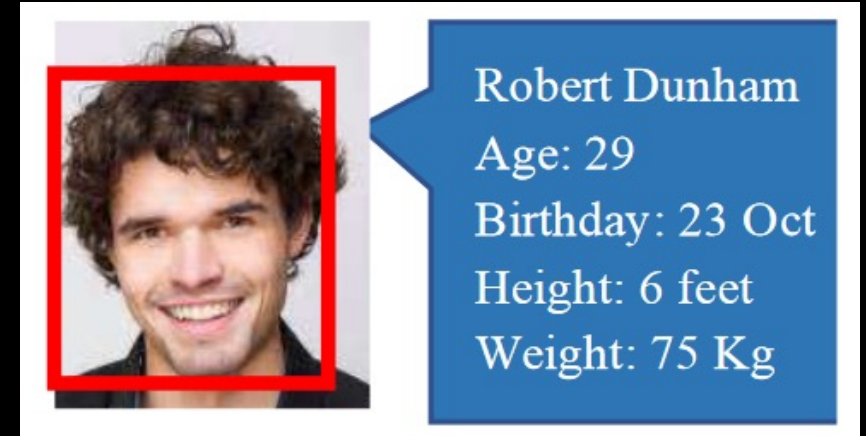
Voluntary Data Sharing

- HMDs as AT **in the workplace**

- Employees willing to share with visually impaired colleagues

- Increased when control over their data was guaranteed

Photo via Ahmed, et al., UbiComp 2018

Privacy Concerns

- Users want rich sensing capabilities
  [Shinohara & Wobbrock, 2011; Findlater *et al.*, 2019]

- Must be responsible, yet effective

Example:
What issues arise with a system that visually describes how someone looks?

My interest in this workshop

Question for the Community

How can head-mounted displays for assistive purposes be designed in a way that will allow the wearer to disclose that purpose, but only when desired?

Thank You

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