Social Tensions with HMDs for Accessibility

>> [Indiscernible] which made up of the cotton.

>> It feels narrow. You have to extend. Because cotton is [indiscernible] at defusing light.

>> Yeah.

>> Why can't you try to pitch both of them?

>> I can work with another guy and he can pitch one and I can pitch one.

>> All right I have another meeting. See you.

>> What are you doing?

UNIVERSITY of WASHINGTON





University of Washington

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About Me

First year Ph.D. student Advised by Dr. Leah Findlater B.S. in math from Minnesota Prior work in e-textiles



UNIVERSITY of WASHINGTON

inclusive design lab

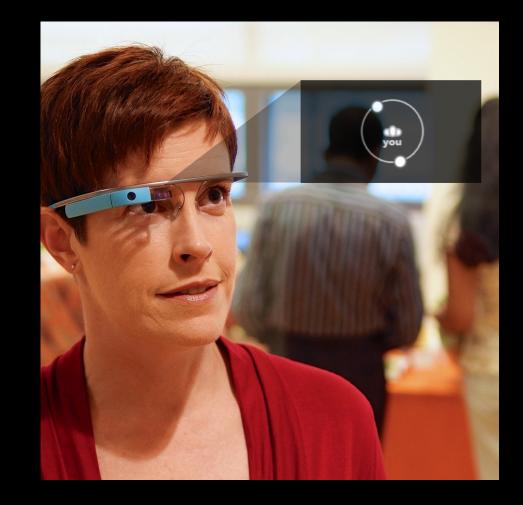
Photo via Univ. of Washington

Research Interests

- Wearable assistive devices
- Considering needs and preferences
- Inclusive development process

My Research Wearable Sound Sensing and Feedback





Photos via Jain et al., CHI 2015, ASSETS 2018

Social Tensions with HMDs for Accessibility

Real-time Captioning

We're going down the stairs-now...

Photo via Jain et al., ASSETS 2018

Augmenting Vision

Photo via Stearns et al., ASSETS 2018

and factors are contributing: geolog d ice caps are melting; warming seav

weakening and carrying less water a:

The average elevation of the Deal Is

Famine, drought, sickness and extin

thly life if carbon emissions aren't

ntually halted. But for Katherine











Photo via Williams, et al., CHI 2015

HMDs as Assistive Technology Key Social Challenges

- 1. Perception and Stigma
- 2. Effective Communication
- 3. Sensing and Privacy

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Public resistance to HMDs



Stigmatization of Assistive Tech

Photos via Youtube, The Guardian

Disability Affects Perception

VS.

With assistive accessories



Higher social acceptability

No indications of disability



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

Photos via Profita, et al., CHI 2016

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Conditions: And Tare % × −4 ← −3 O | assument

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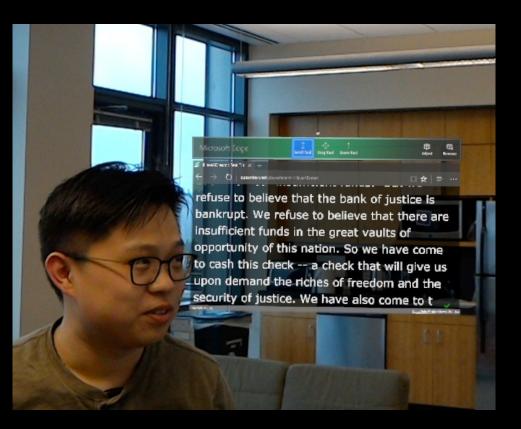
Photo via Jain, et al., ASSETS 2018

Sound Source Location

Video via Jain, et al., CHI 2015

- High cognitive effort
- Obscured facial expressions
- Burden of adapting

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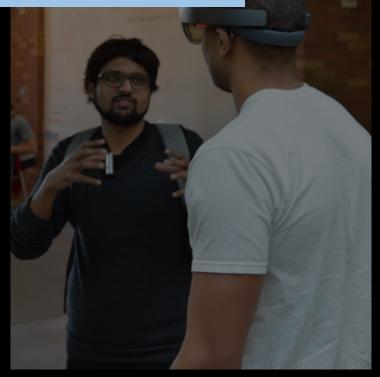


- High cognitive effort
- Obscured facial expressions
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How do we address these issues?

- High cognitive effort
- Obscured facial expressions
- Burden of adapting



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Photo via Peng, et al. CHI 2018

Voluntary Data Sharing



Robert Dunham Age: 29 Birthday: 23 Oct Height: 6 feet Weight: 75 Kg

- HMDs as AT in the workplace
- Employees willing to share with visually impaired colleagues
- Increased when control over their data was guaranteed

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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