CSE440: Introduction to HCI

Methods for Design, Prototyping and Evaluating User Interaction

Lecture 13:
Accessibility

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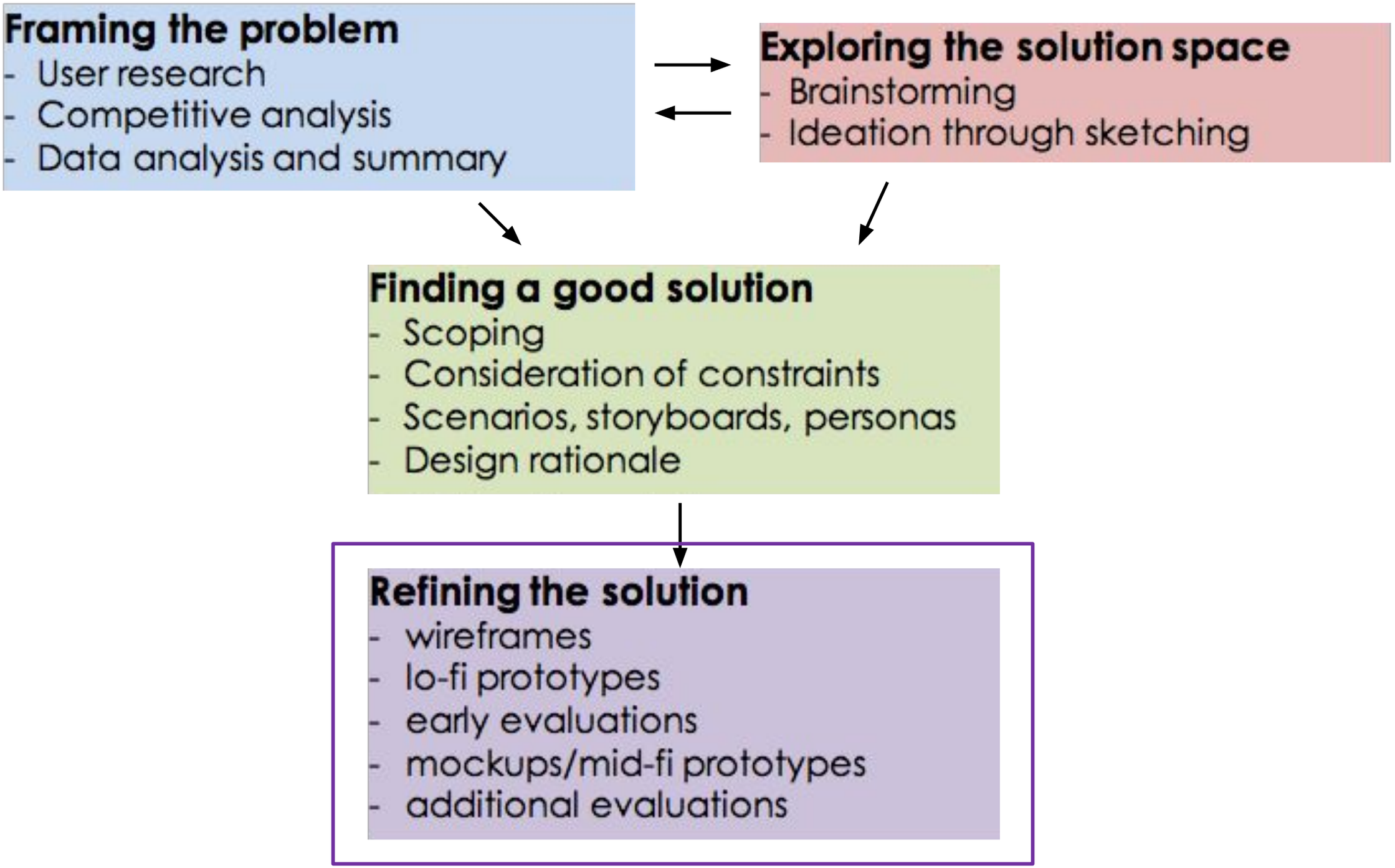
DESIGN
USE
BUILD

PAUL G. ALLEN SCHOOL
OF COMPUTER SCIENCE & ENGINEERING

Project Status



This Week

May 13	May 14	May 15	May 16	May 17
3a - Paper Protoype	Accessibility 10:00 - 11:20 | OUG 136	3b - Heuristic Evaluation Nigini's office hours 10:00 - 12:00 Allen Center 338	Patterns 10:00 - 11:20 | OUG 136	Section 10:30 - 11:20 | MGH 058 11:30 - 12:20 | MGH 058 1:30 - 2:20 | MGH 058 2:30 - 3:20 | MGH 058 Reading 3: Usability Testing 3c - Usability Testing Check-In

A Basic Tenet of Design

You are not designing for yourself

- You bring a lot of background to the table
- That background is your asset
- But you also need to be mindful of it

You need to understand the context of your design and the people who will use it

- What this means can vary widely
- And may be beyond what you can or will do

Pinkification

Understanding others' needs is really complicated

And there is no shortcut

We will start with an example:

Do you like the pink color?

Bic for Her

Finally! For years I've had to rely on pencils, or at worst, a twig and some drops of my feminine **blood to write down recipes** (the only thing a lady should be writing ever). I had despaired of ever being able to write down said recipes in a permanent manner, though my men-folk assured me that I "**shouldn't worry your pretty little head**". But, AT LAST! Bic, the great liberator, has released a womanly pen that my gentle baby hands can use without fear of unlady-like calluses and bruises.

Thank you, Bic!

http://www.forbes.com/sites/davidvinjamuri/2012/08/30/bic-for-her-what-they-were-actually-thinking-as-told-by-a-man-who-worked-on-tampons/

Bic for Her

It is very, very hard to imagine that the people who made the decision to launch “Bic for Her” were the same women expected to buy them.

http://www.forbes.com/sites/davidvinjamuri/2012/08/30/bic-for-her-what-they-were-actually-thinking-as-told-by-a-man-who-worked-on-tampons/

(Bic for Her)

Kodak, 1926

Kodak Vest Pocket Series III
(1926)

Kodak launched
this black camera in 1926

It was successful,
but was selling more to men

Engaged Walter Dorwin Teague to
design a model that would appeal to women

Kodak, 1926

Kodak Vest Pocket Series III (1926)

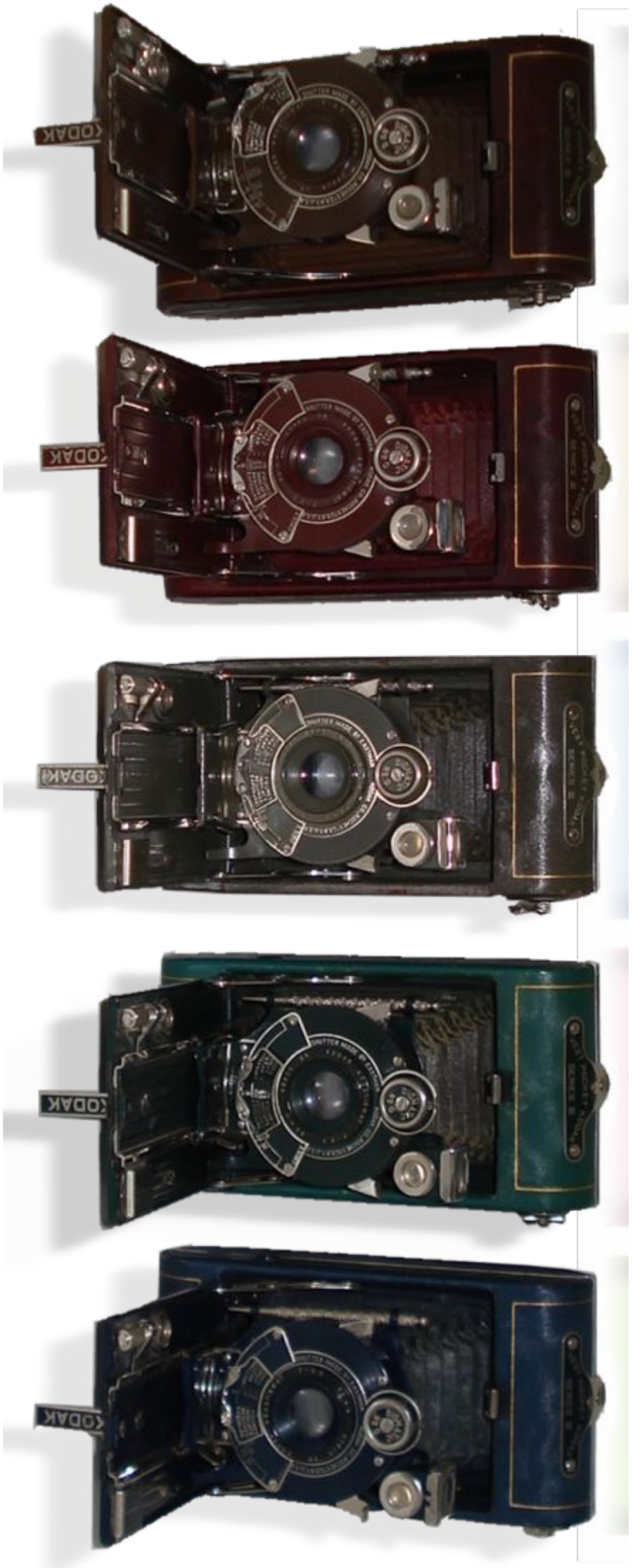
Kodak launched
this black camera in 1926

It was successful,
but was selling more to men

Engaged Walter Dorwin Teague to **design a model that would appeal to women**

His solution was to release the camera in 5 different colors, each packed in a pseudo-silk lined box, where the box and liner matched the color of the camera

Walter Dowrin Teague
Vanity Kodak (1928)



Apple, 2001

Apple G1 iPod,
October 2001

Apple launched this white iPod in 2001

It was successful, but was selling more to men

NEED: **design a model that would appeal to women**

Their solution was a selling the iPod in 5 new different colors

Jonathan Ive
Apple iPod Mini
(2004)

Jonathan Ive
Apple iPod Mini
(2004)

Walter Dowrin
Teague
Vanity Kodak (1928)

Observations by Buxton

- Same basic design brief
  - Same use of color
  - Same number and choice of colors
  - Same simultaneous release of colors
- Teague / Kodak example is a classic
  - Known to any trained industrial designer
  - Jonathan Ive is an extremely well trained designer
  - Draws inspiration from the past

Observations by Buxton

"That is simply good, intelligent design in action. It is also a **very good lesson**: an obsession with the new and original, without a **deep literacy and appreciation for the past**, leads to a path of missed opportunities."

Design, preferences and choice

Abandoning “One Best Design”

People have different preferences

- We can study these preferences
- We can even predict these preferences

A design that emphasizes one preference will generally disadvantage some other preference

- Not always, because software is malleable

How should we think about differences

- One powerful viewpoint is social justice

People with Disabilities

1 billion people worldwide

15% of the population

50 million people in US

Including yourself if you are fortunate to live to develop disabilities

A Social Justice Problem

1 billion people worldwide

15% of the population

50 million people in US

16% of people in the US
10% of workforce
5% of STEM workforce
1% of PhDs in STEM

Including yourself if you are fortunate to live to develop disabilities

A Social Justice Problem

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Including yourself if you are fortunate to live to develop disabilities

16% of people in the US

10% of workforce

5% of STEM workforce

1% of PhDs in STEM

Are we reinforcing this or are we working against this?

Accessibility

Designing products/services that are accessible to people with disabilities

Different types of accessibility

- Web / Mobile (aka Digital)
- Physical

Accessibility is the Law

Americans with Disabilities Act (ADA), 1990

- Requires accessibility in employment, public entities and public transportation, public accommodations and commercial facilities

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Rehabilitation Act, 1973 (+ Rehab Act, Section 508, 1998)

- Mandates federal procurement of accessible electronic and information technologies

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Rehabilitation Act, 1973 (Section 508, 1998)

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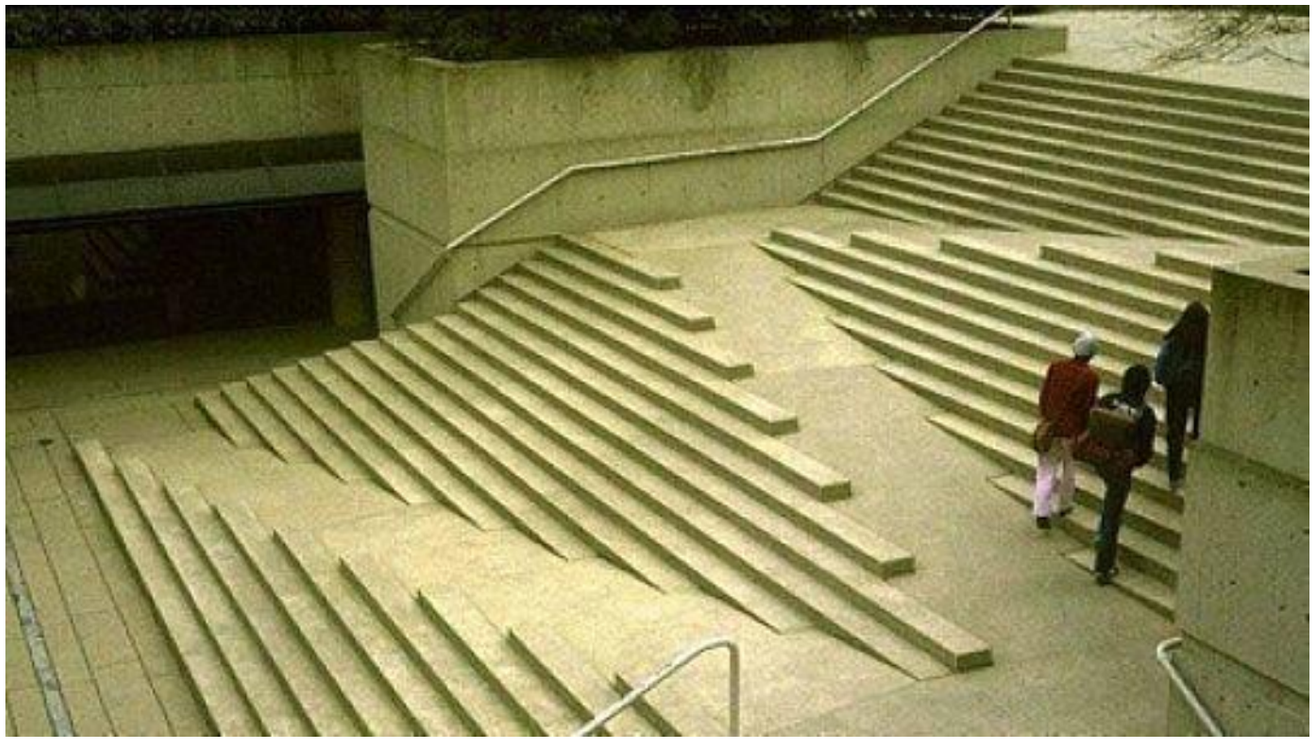
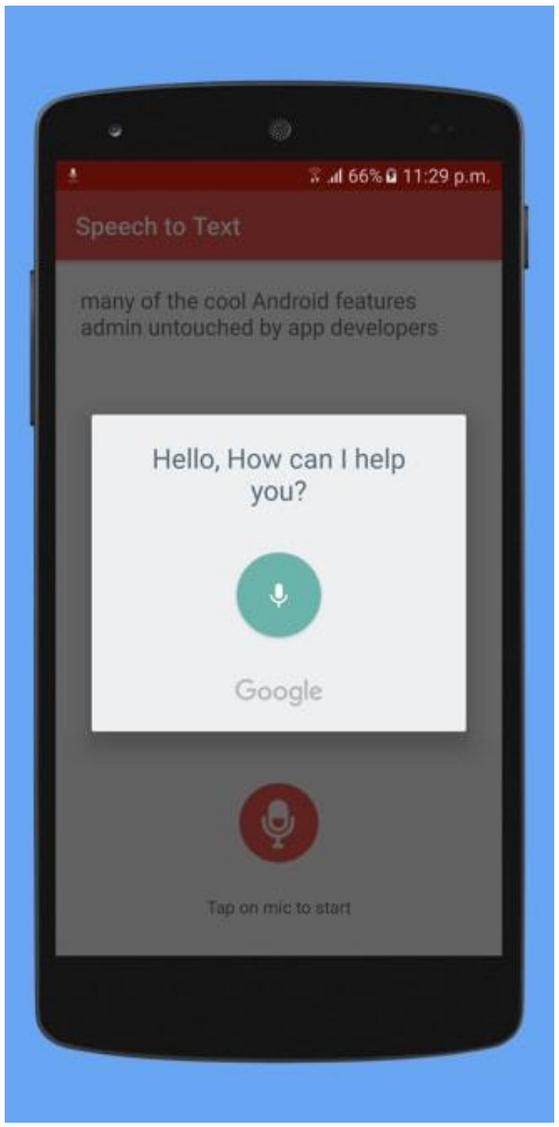
National Federation of the Blind vs. Target, 2006

Universal Design vs. Assistive Technology



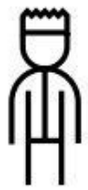
Accessible design



Creating tax returns is always connected to hours of work and preparation. Even if you have hired a tax accountant, there will be still a lot of effort ahead of you. You will have to collect and organize all of your tax-related documents like receipts or invoices at once. So save time and money by preparing all of these documents beforehand and Scanbot can help you doing so.

Go paperless and save valuable time

Filing and archiving all of your documents like bank statements, bills or receipts takes hours. Rummaging through the mountains of paperwork to find the documents you need for your tax return can even take longer. To bypass this exhausting procedure, start going paperless by scanning all of these documents with Scanbot. Just scan the relevant paperwork when you receive it. This will only take a few seconds and save you time when it comes to preparing your annual accounts.

	Permanent	Temporary	Situational
Touch	One arm	Arm injury	New parent
See	Blind	Cataract	Distracted driver
Hear	Deaf	Ear infection	Bartender
Speak	 Non-verbal	Laryngitis	Heavy accent

Inclusive
A Microsoft Design Toolkit

Microsoft, 2016

Personal Texting by Deaf People

Teletypewriter (TTY) used by deaf people in their homes circa 1970

1990s TTY with built-in acoustic modem

SMS texting

What have the tech industry done?

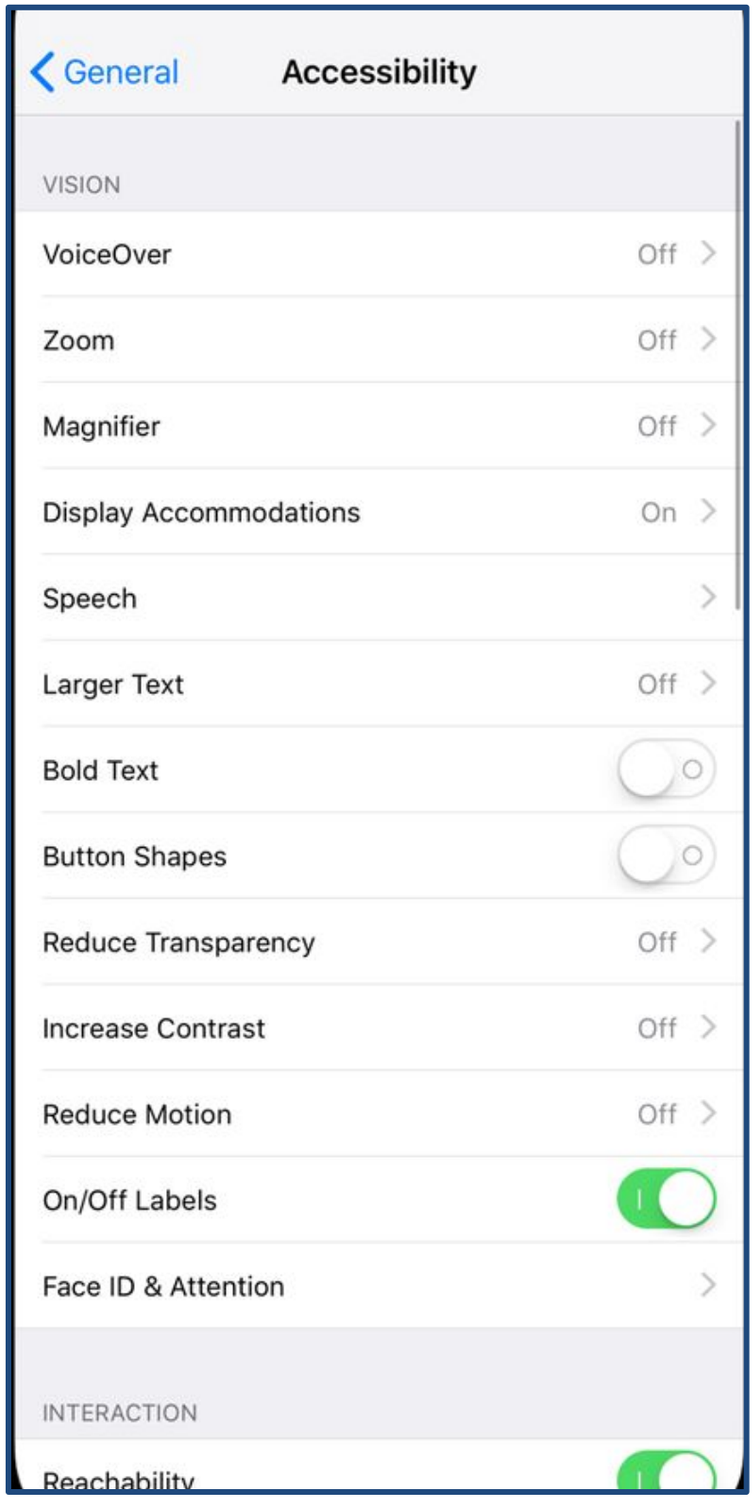
MS Word Accessibility checker (video)

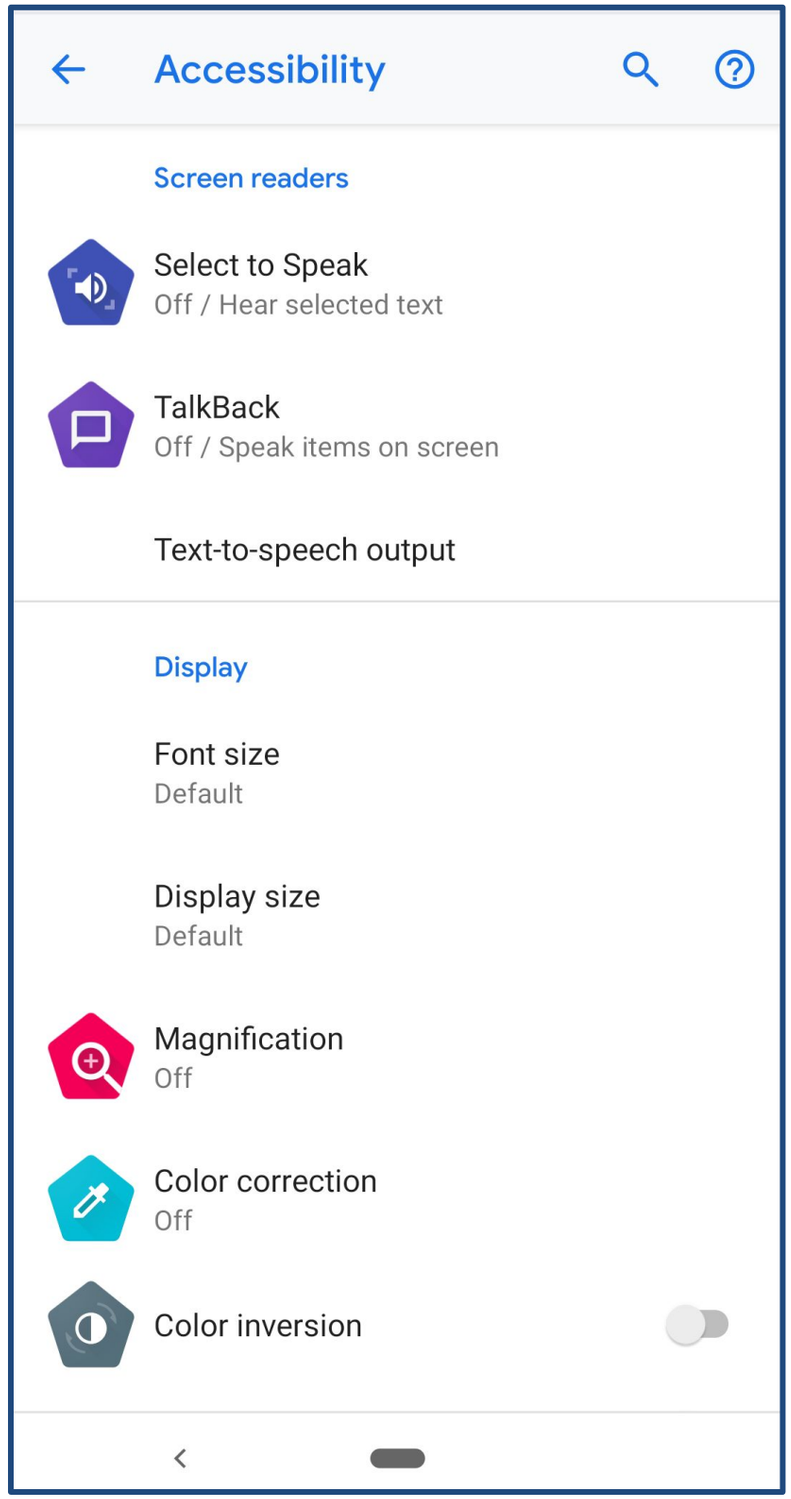
Chrome Console/Audit Tools (video)

Accessible Graphics by SAS (DUB seminar)

Apple promotes 2017 capabilities (video)

Current State of Devices





Equal Access to Information

Are these designs promoting equal access?

Equal Access to Information

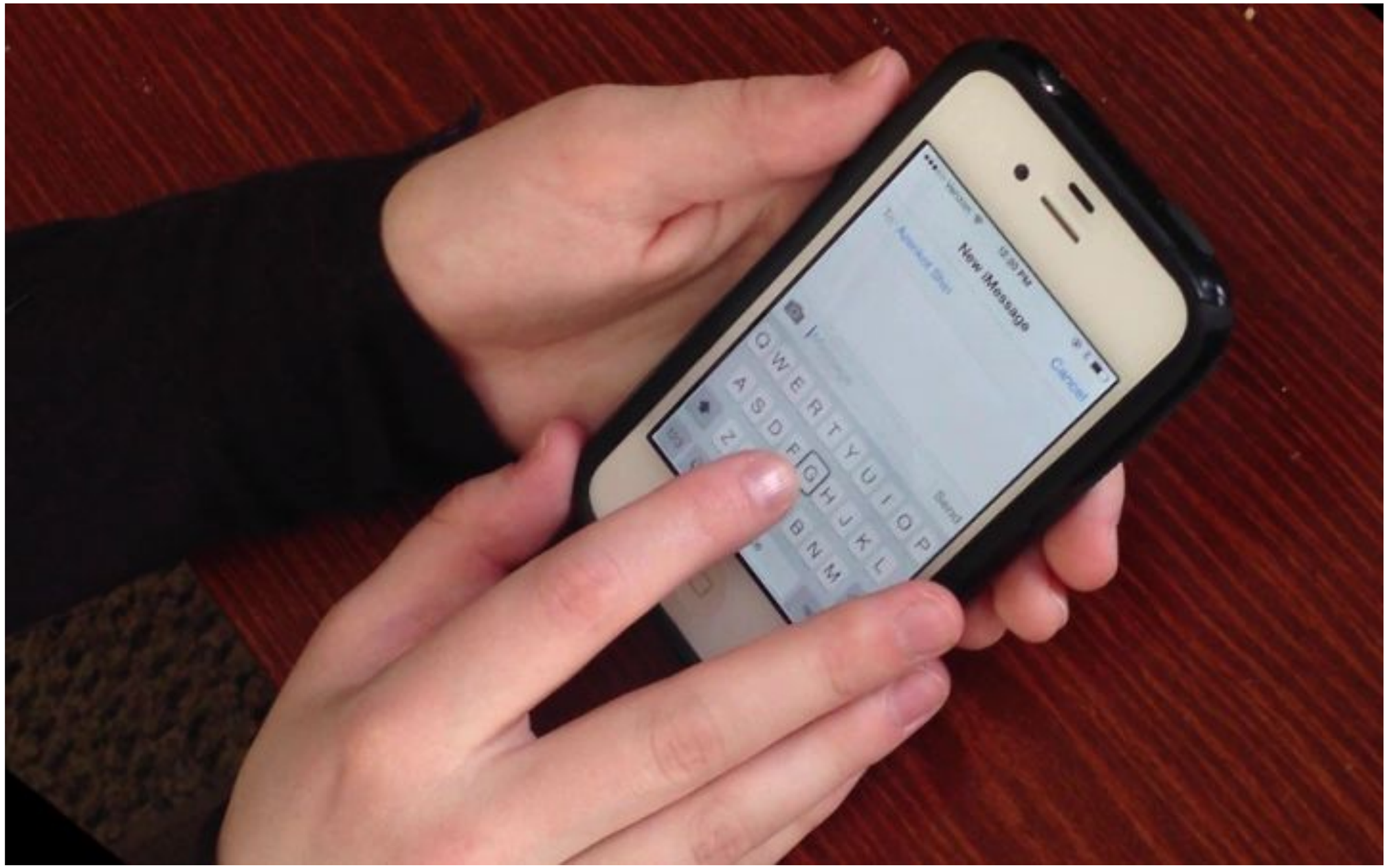
Are these designs promoting equal access?

Some dimensions to consider

- Cost
- Speed
- Accuracy
- Ease

Simply being possible is not enough

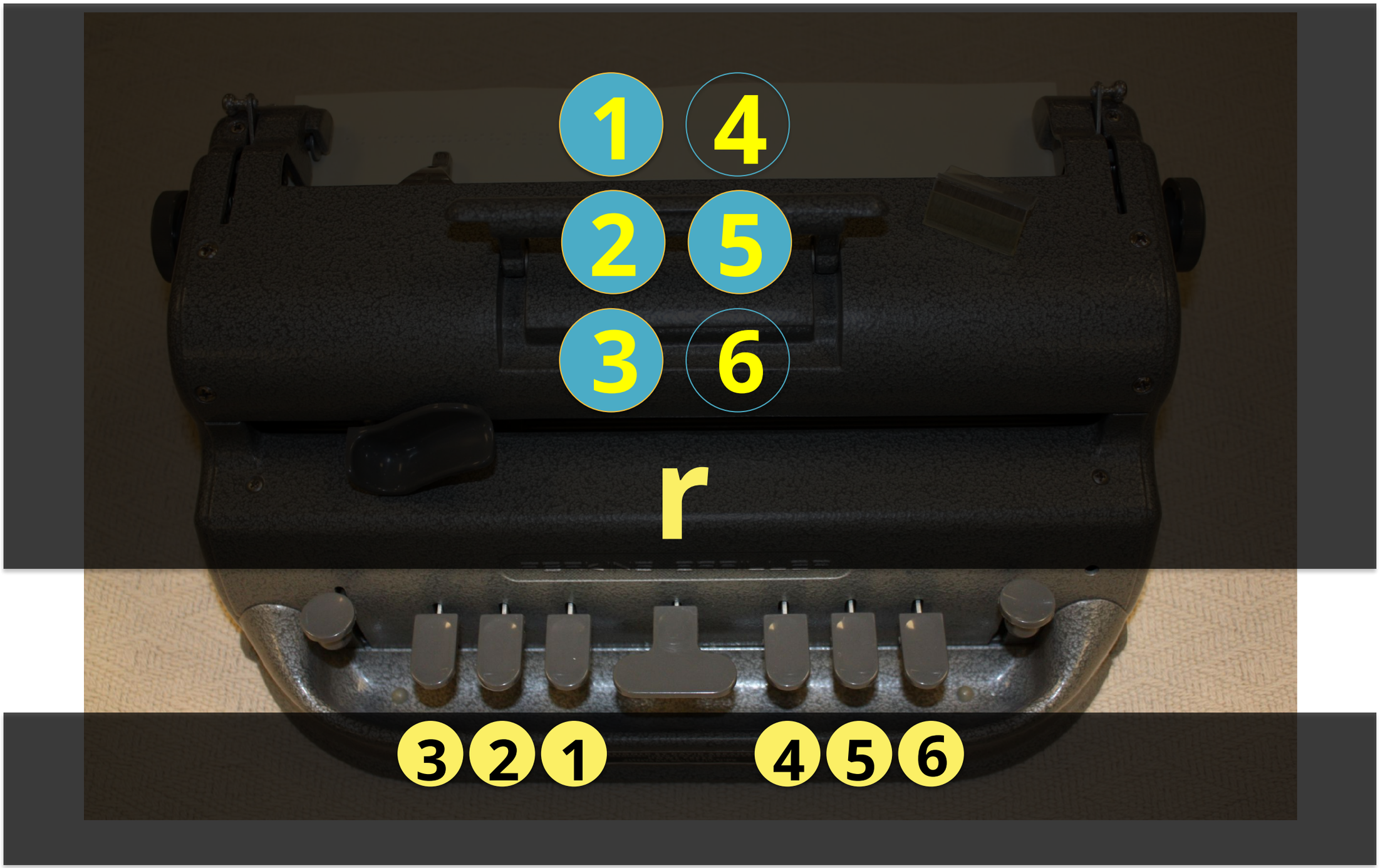
A Closer Look at Text Entry



Azenkot

Contrast with Braille Input

Contrast with Braille Input



Perkinput

Azenkot et al, GI 2012

Perkinput

Ability-Based Design

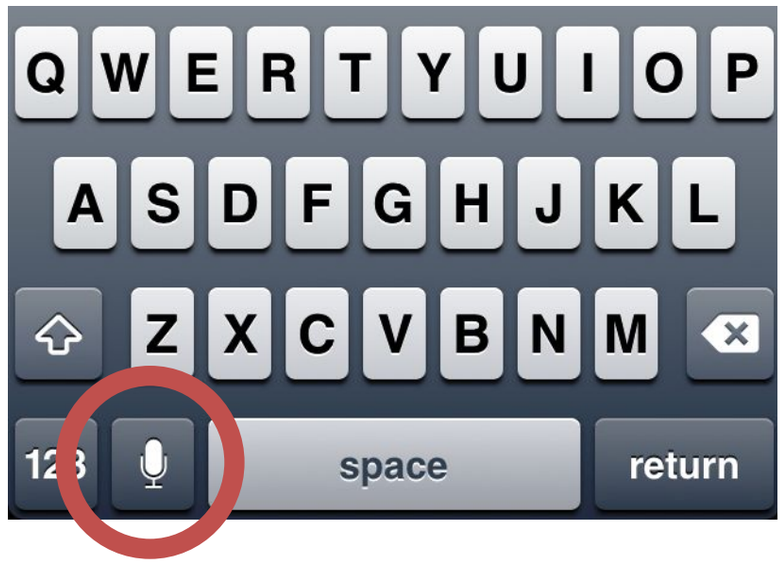
States that all interfaces make assumptions about the abilities needed to use them

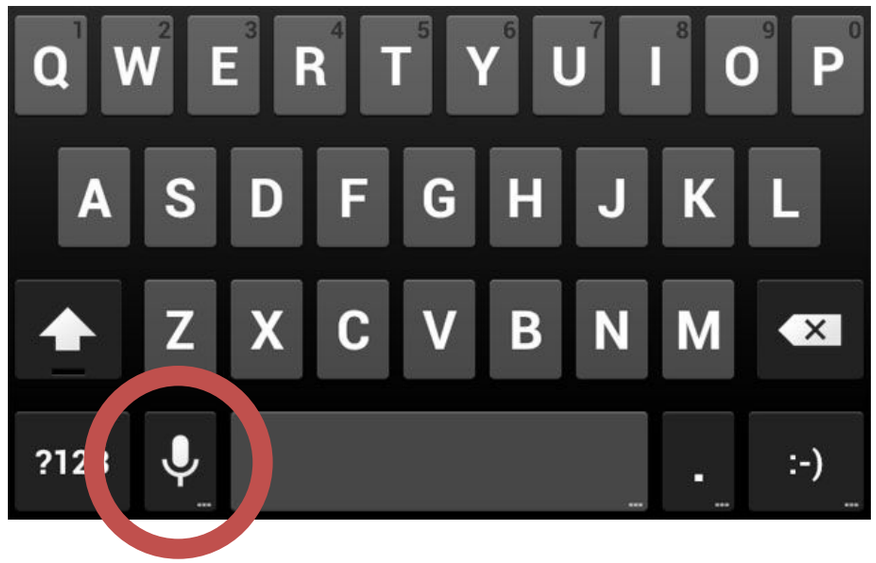
Any one-size-fits-all design is therefore inaccessible to many people

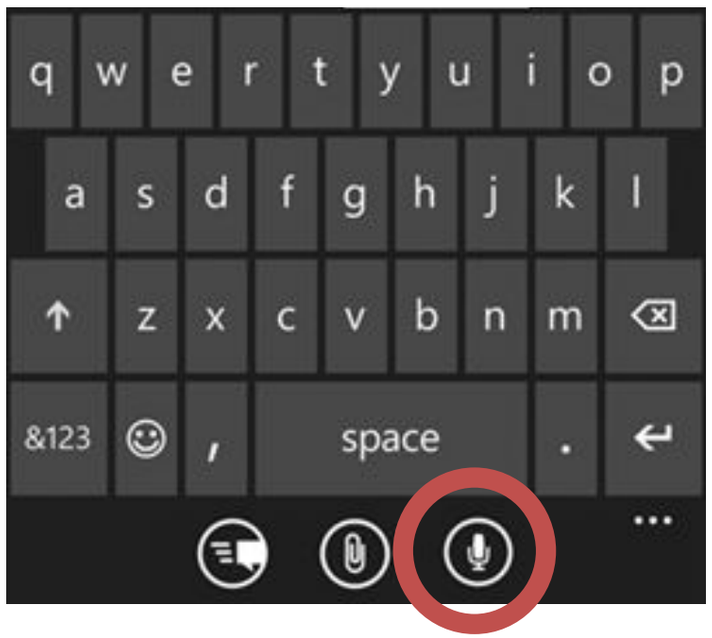
Instead of asking people to struggle to adapt, asks that interfaces adapt or be adaptable to match the abilities of each person

Wobbrock, TACCESS, 2011

Speech Input







Azenkot et al, ASSETS 2013

Accessibility is More than Text Entry

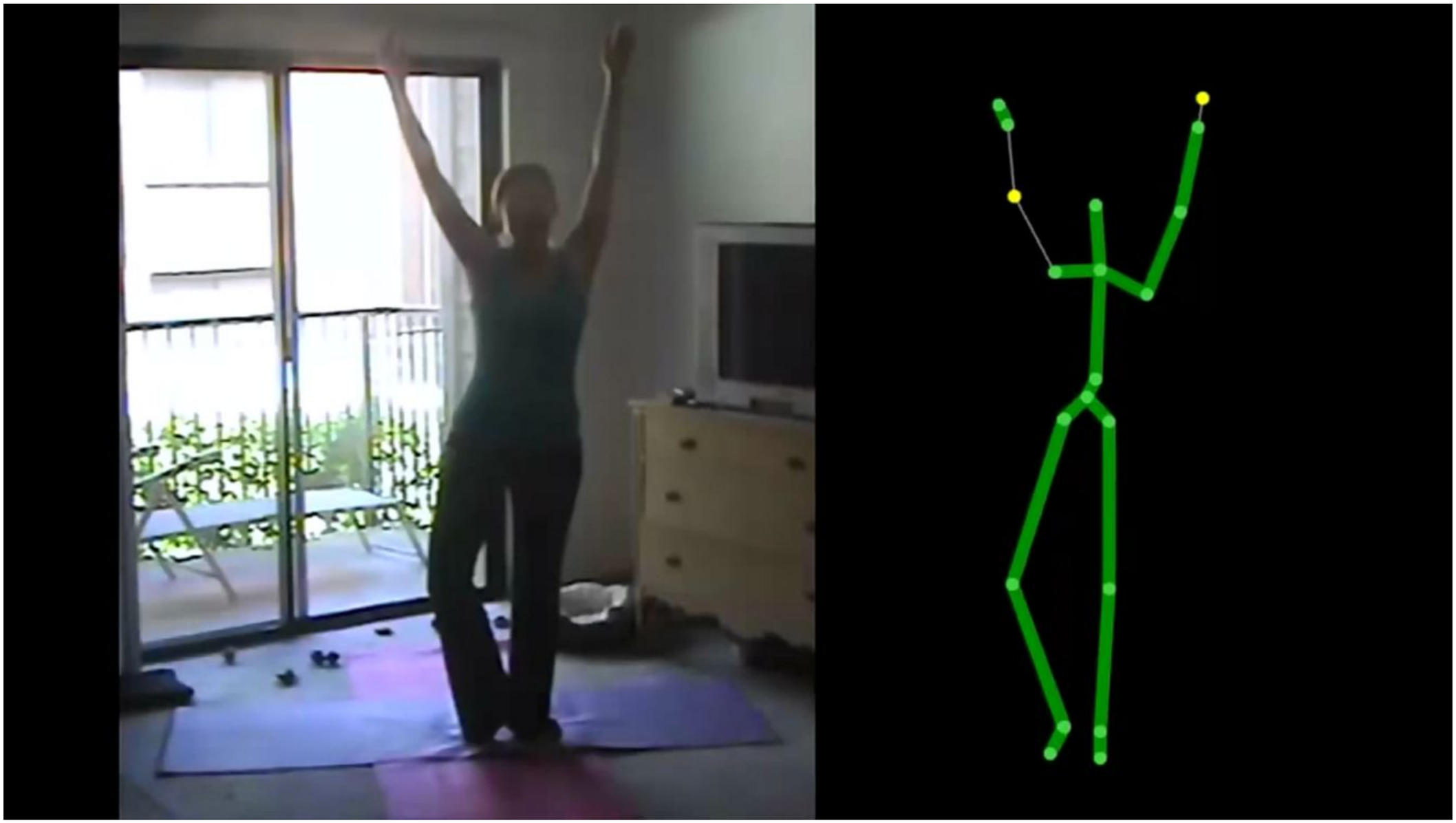
"Sometimes you don't follow along as well unless [you are] one on one."

Eyes-Free Yoga, Rector et al, ASSETS 2013

Accessibility is More than Text Entry

Eyes-Free Yoga, Rector et al, ASSETS 2013

Accessibility is More than Text Entry



Eyes-Free Yoga, Rector et al, ASSETS 2013

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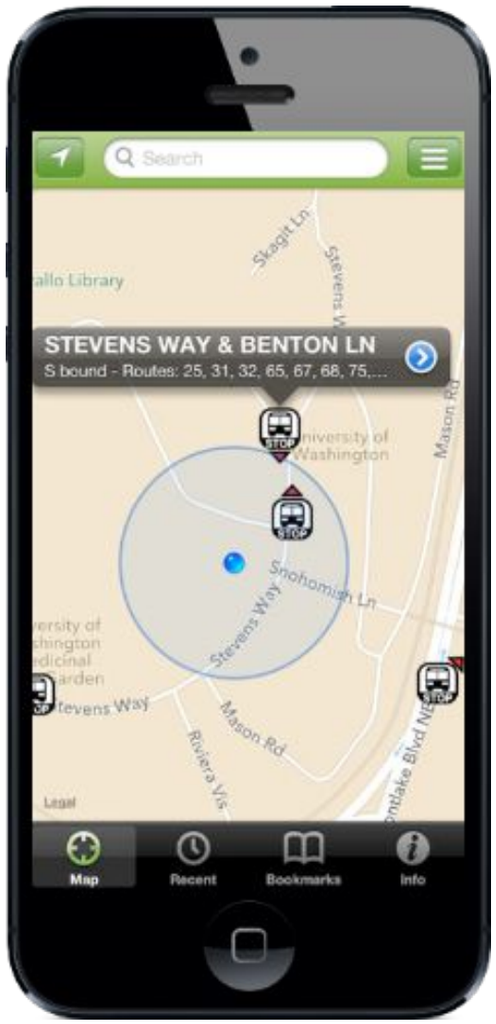
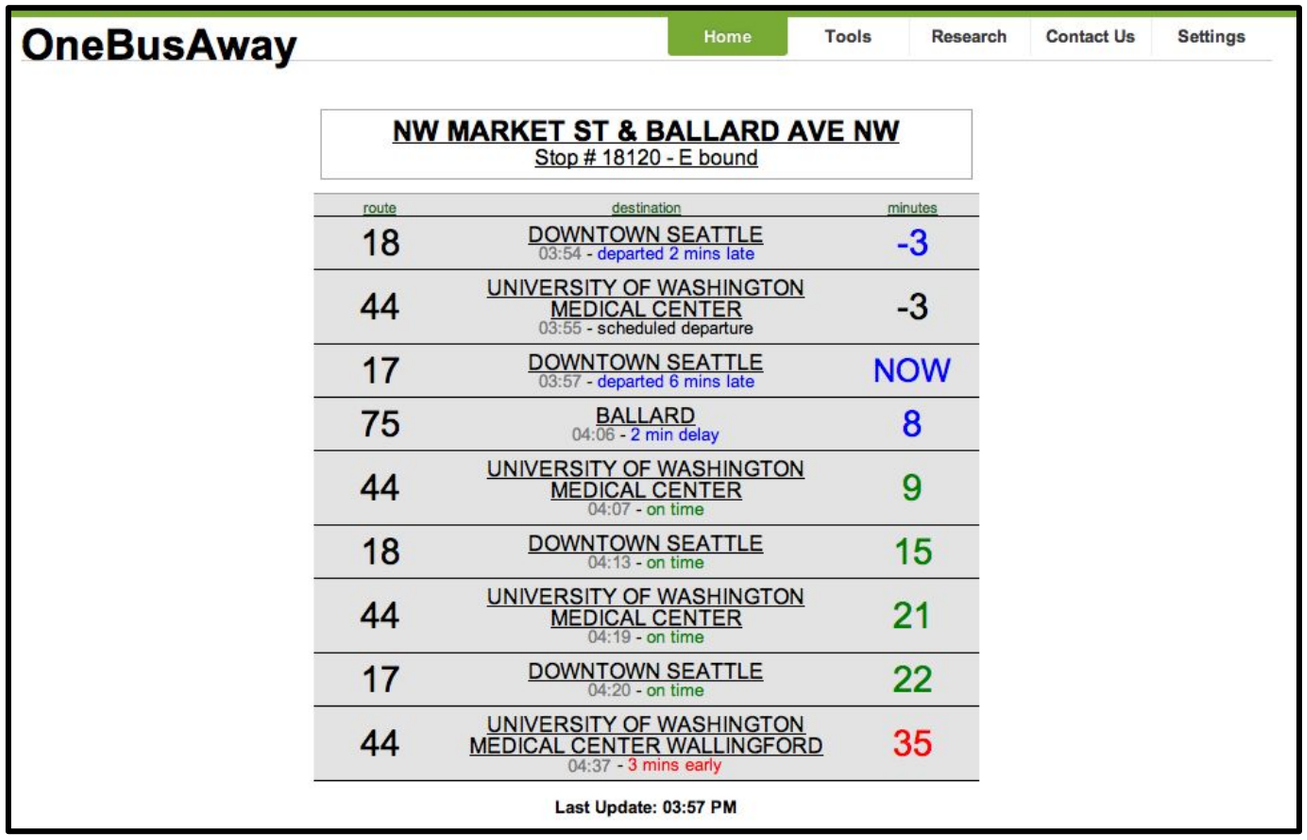
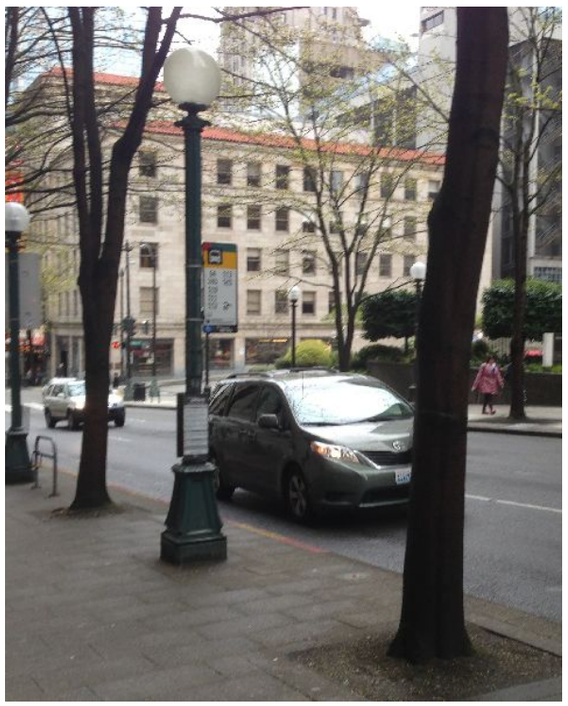




Ferris et al, 2010

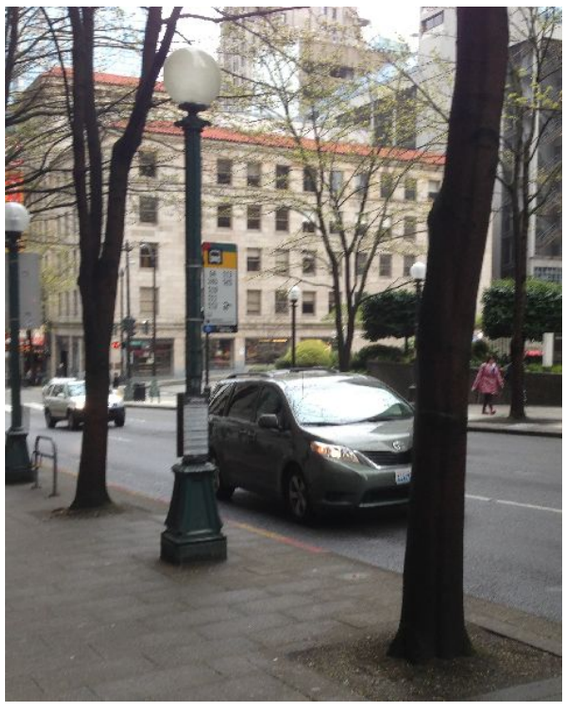
Accessibility is More than Text Entry



How do you find a bus stop?

Azenkot et al, CHI 2011

Accessibility is More than Text Entry



"I have to ask people for information a lot. Sometimes I call Metro to figure out where the stop is [located] approximately, but they still can’t exactly tell you (...)"

Azenkot et al, CHI 2011

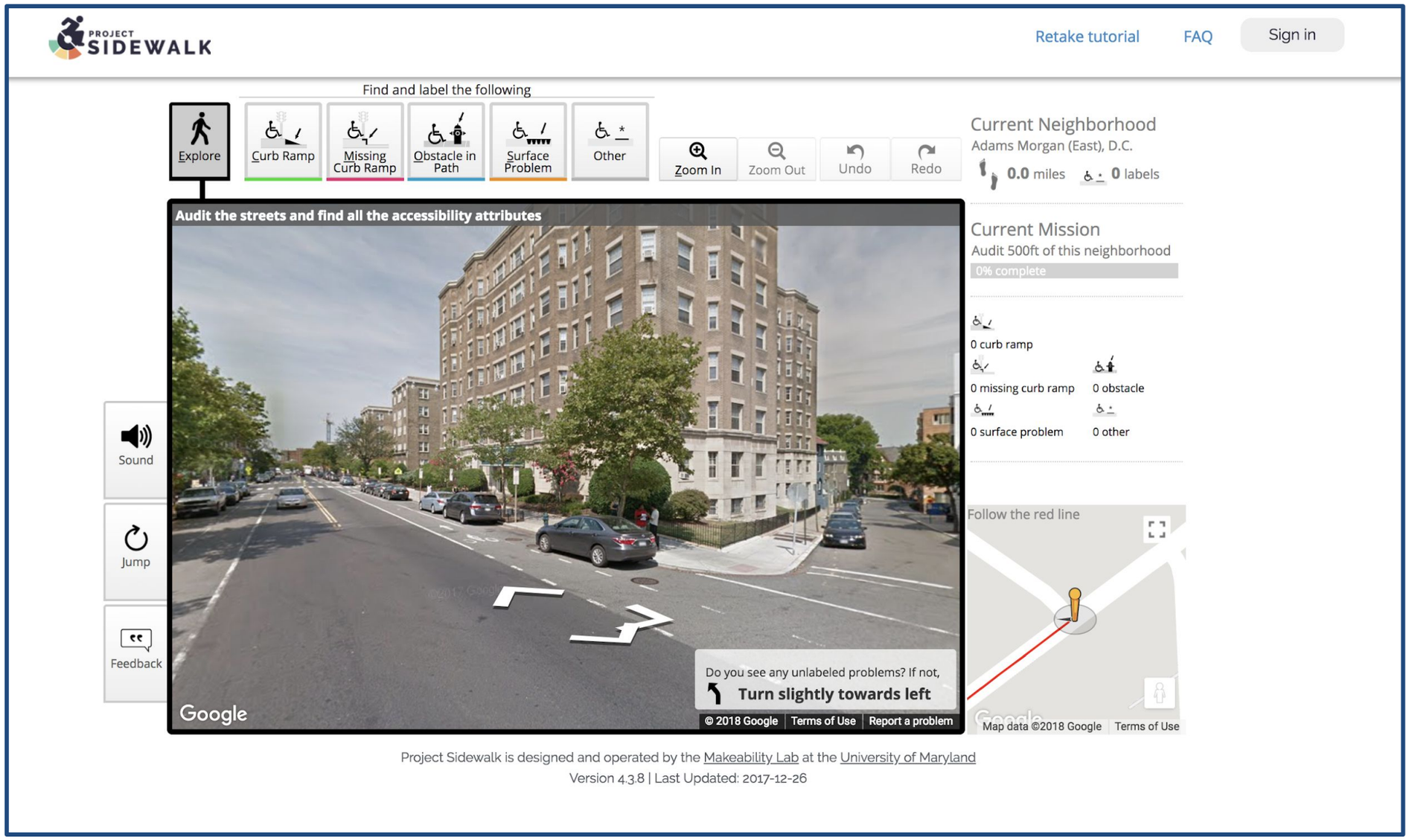
Accessibility is More than Text Entry

Project Sidewalk - projectsidewalk.io

Saha et al, ASSETS 2017

Accessibility is More than Text Entry

Project Sidewalk - projectsidewalk.io



What is Disability?

The old model is medical, focused on the individual with a mindset of **“fixing” an impairment**

Current model understands **disability is imposed by society and design** not accounting for diversity:

> “Disability is thus not just a health problem (…) [it is] the interaction between features of a person’s body and features of the society in which he or she lives.
>
> Overcoming the difficulties…requires interventions to remove environmental and social barriers.”

What is Disability?

Impairment

a problem in body function or structure

Activity Limitation

a difficulty encountered by a person
in executing a task or action

Participation Restriction

a problem experienced by a person
in involvement in life situations

A Social Justice Problem

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Including yourself if you are fortunate to live to develop disabilities

Diverse participation is critical in effective design!

Team activity

With your project team, identify one disability your current design is creating!

Ask me something!