

CS 321: Introduction to HCI

Methods for Design, Prototyping and Evaluating User Interaction

Lecture 20:
Accessibility

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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!

[Bic Amazon review](#)

[Forbes Article](#)

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.

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)

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It was successful,
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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

A Social Justice Problem

1 billion people worldwide
15% of the population

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

50 million people in US

Our abilities change
over time and age

**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

Rehabilitation Act, 1973 (Section 508, 1998)

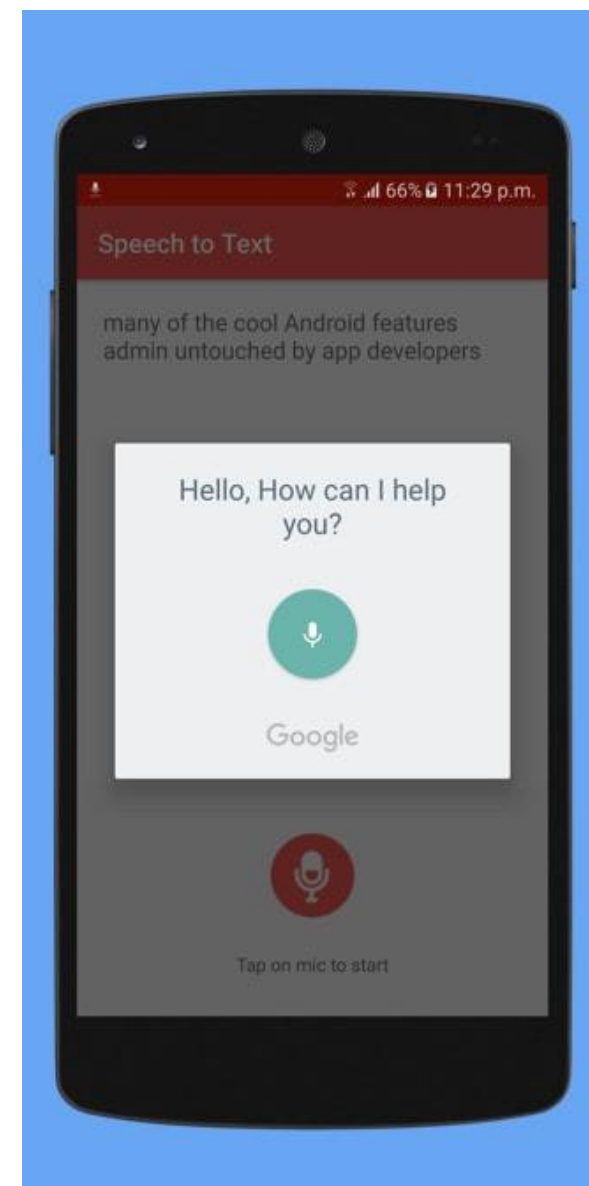
Mandates federal procurement of accessible electronic and information technologies

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

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?

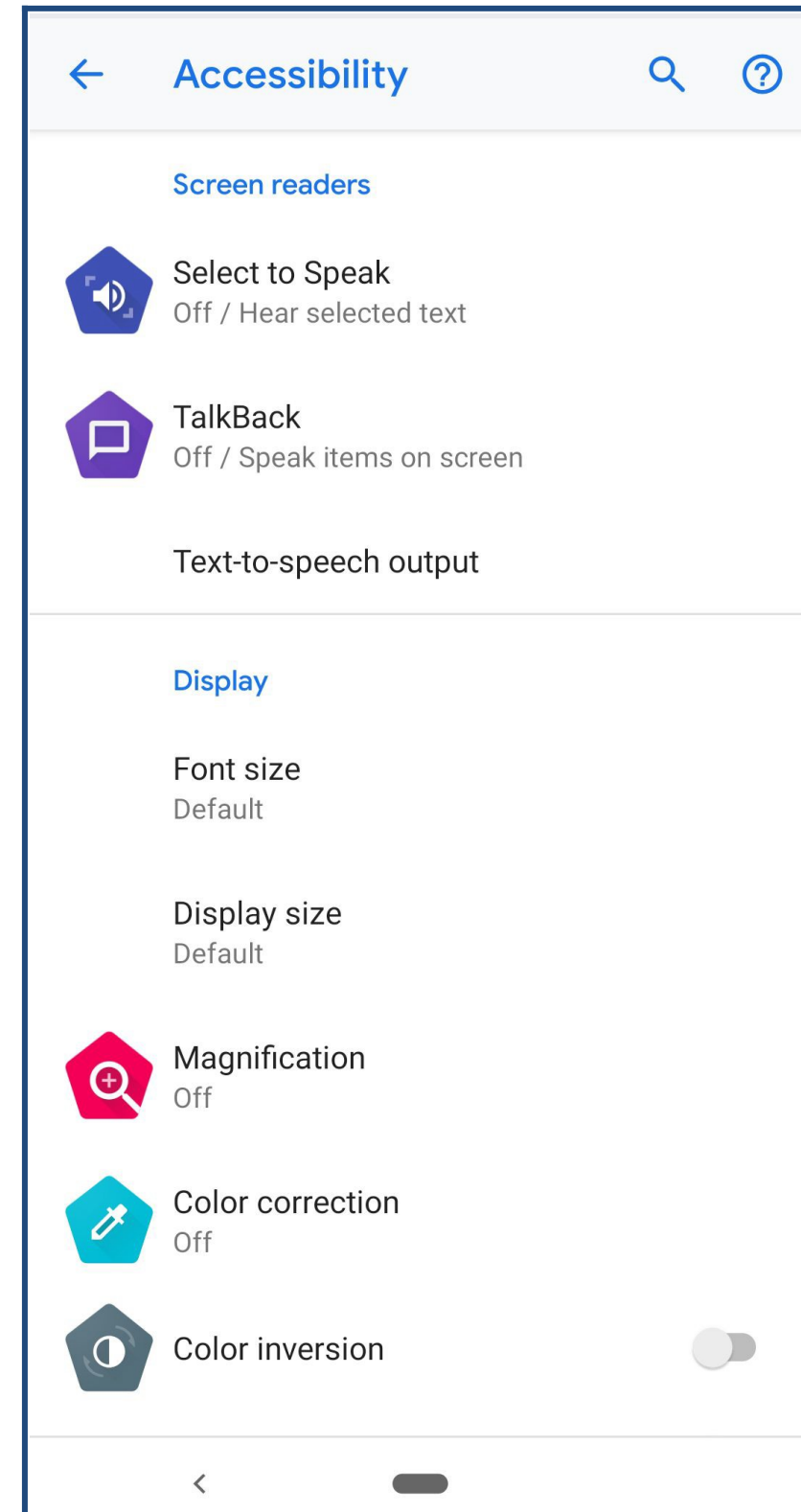
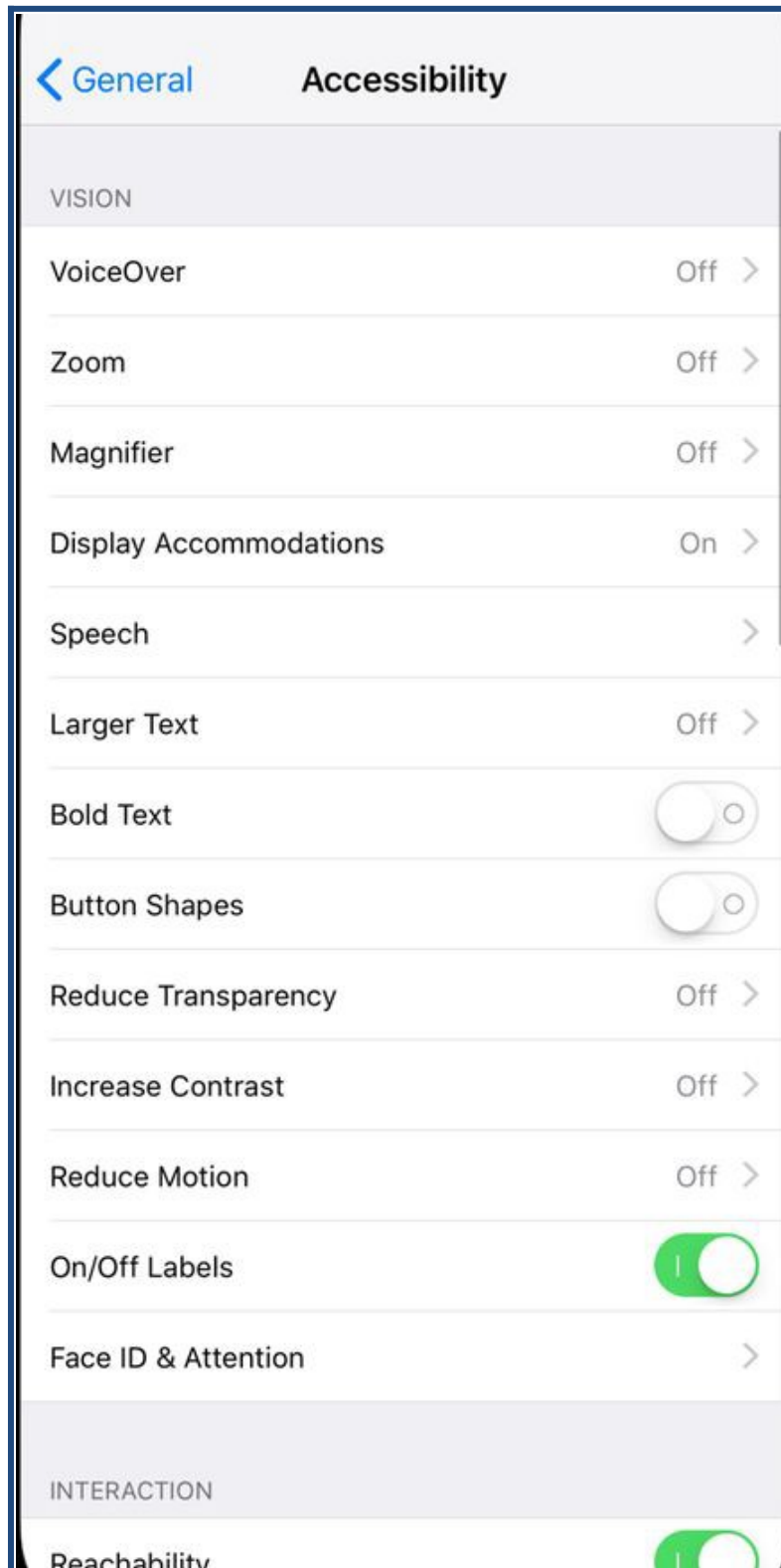
MS Word Accessibility checker ([video](#))

Chrome Console/Audit Tools ([video](#))

Accessible Graphics by SAS ([UW seminar](#))

Apple promotes 2017 capabilities ([video](#))

Current State of Devices



Equal Access to Information

Are these designs promoting equal access?

Some dimensions to consider

Cost

Speed

Accuracy

Ease

Simply being possible is not enough

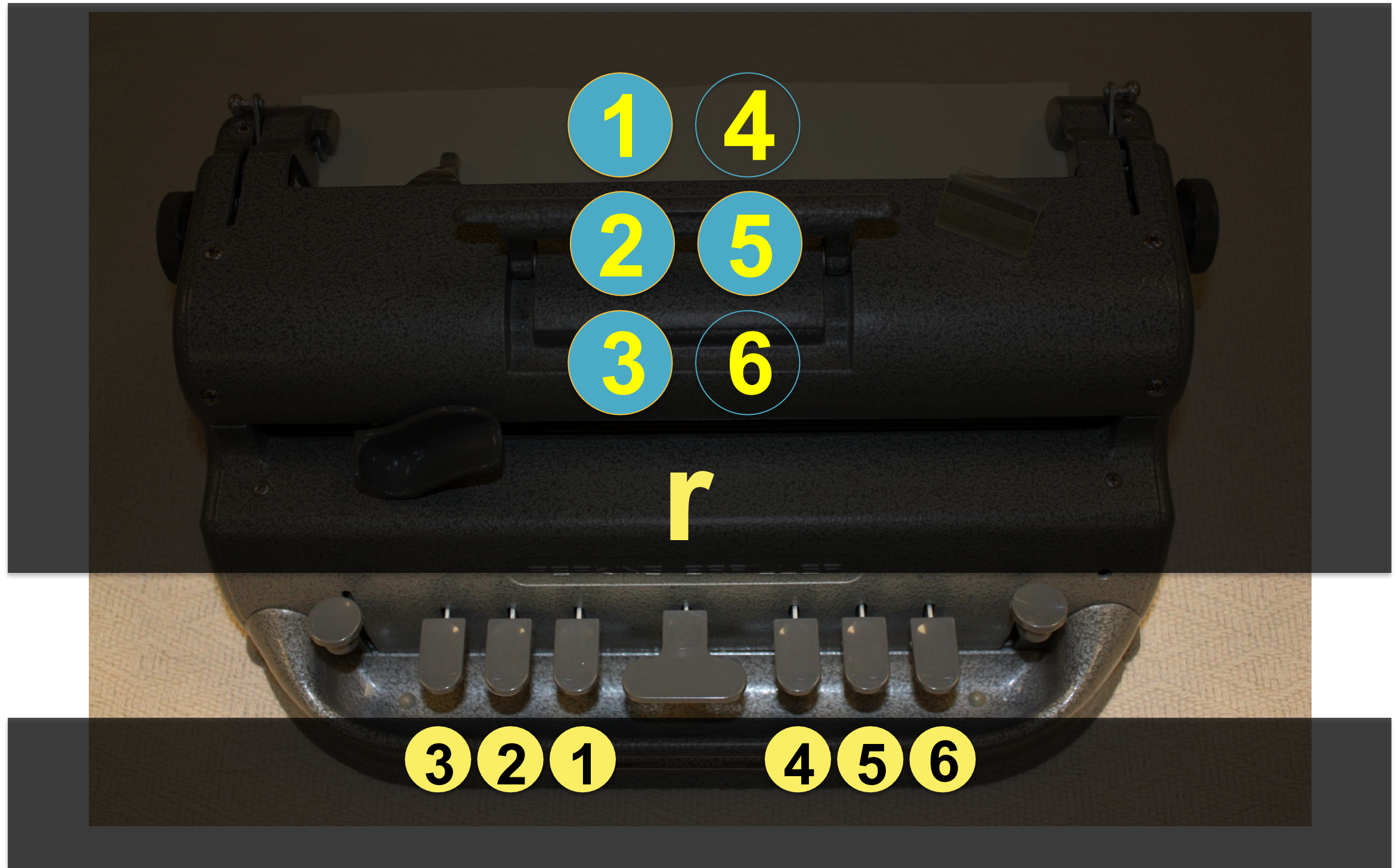
A Closer Look at Text Entry



Contrast with Braille Input



Contrast with Braille Input



Perkinput



Perkinput



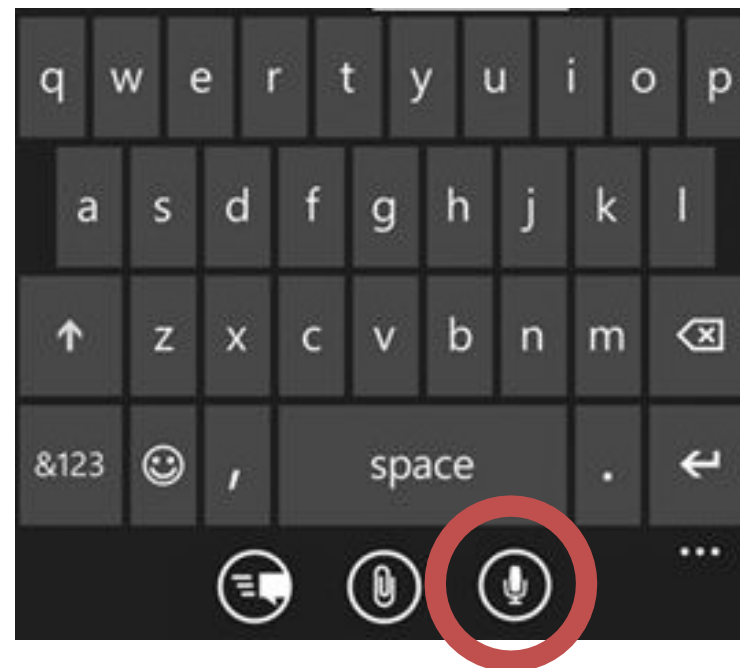
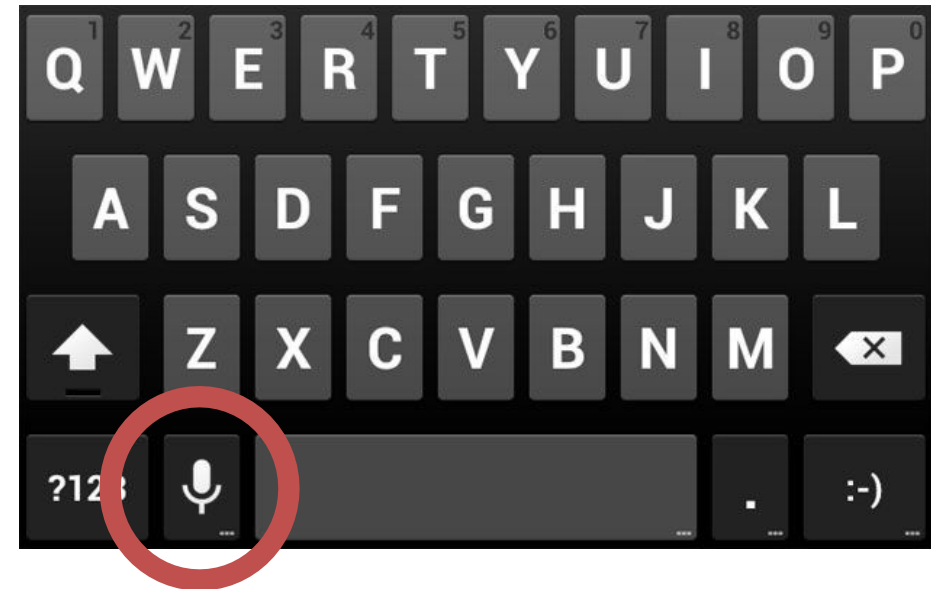
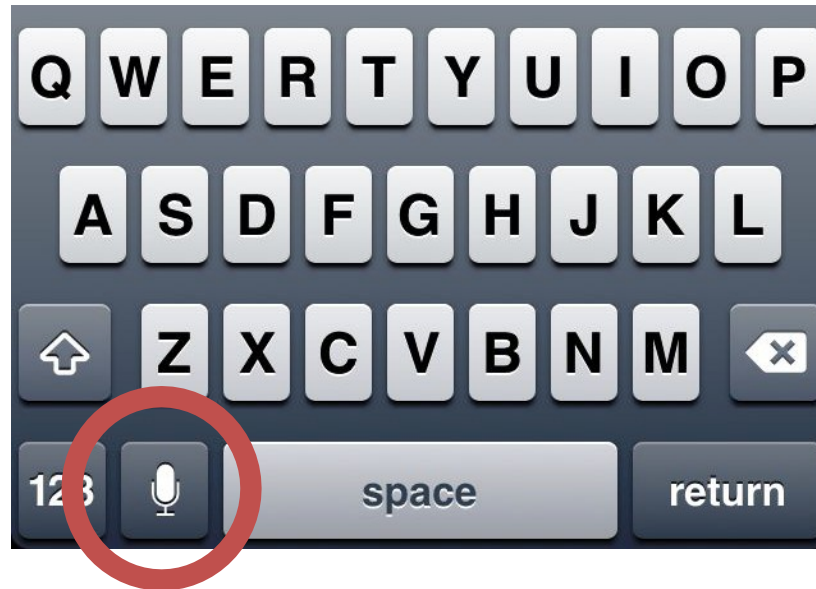
Ability-Based Design

This 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, it asks that interfaces adapt or be adaptable to match the abilities of each person

Speech Input



Accessibility is More than Text Entry

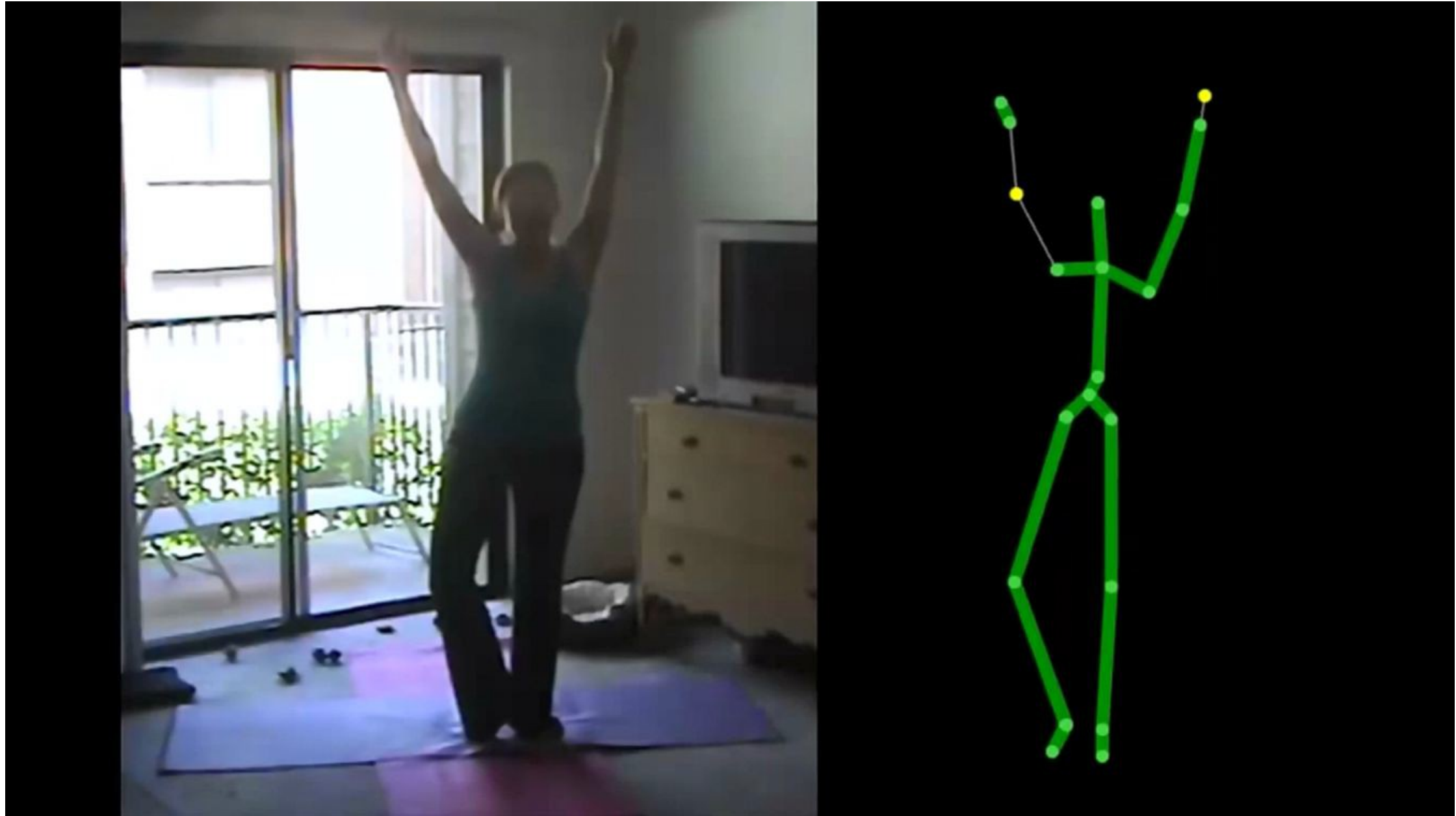


“Sometimes you don’t follow along as well unless [you are] one on one.”

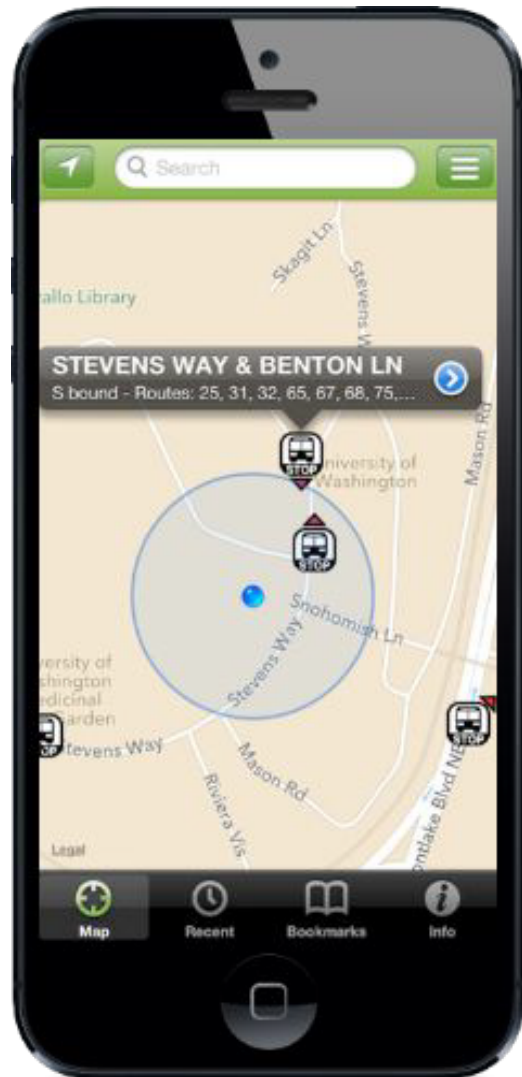
Accessibility is More than Text Entry



Accessibility is More than Text Entry



Accessibility is More than Text Entry



OneBusAway Home Tools Research Contact Us Settings

NW MARKET ST & BALLARD AVE NW
Stop # 18120 - E bound

route	destination	minutes
18	DOWNTOWN SEATTLE 03:54 - departed 2 mins late	-3
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER 03:55 - scheduled departure	-3
17	DOWNTOWN SEATTLE 03:57 - departed 6 mins late	NOW
75	BALLARD 04:06 - 2 min delay	8
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER 04:07 - on time	9
18	DOWNTOWN SEATTLE 04:13 - on time	15
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER 04:19 - on time	21
17	DOWNTOWN SEATTLE 04:20 - on time	22
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER WALLINGFORD 04:37 - 3 mins early	35

Last Update: 03:57 PM

Accessibility is More than Text Entry



How do you find a bus stop?

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 (...)"

Accessibility is More than Text Entry

Project Sidewalk - projectsidewalk.io



Accessibility is More than Text Entry

Project Sidewalk - projectsidewalk.io

The screenshot displays the Project Sidewalk web application interface. At the top left is the Project Sidewalk logo. On the top right, there are links for "Retake tutorial", "FAQ", and a "Sign in" button. Below the logo, a navigation bar contains icons for "Explore", "Curb Ramp", "Missing Curb Ramp", "Obstacle in Path", "Surface Problem", and "Other". To the right of these icons are "Zoom In", "Zoom Out", "Undo", and "Redo" buttons. The main content area features a large street view image with the instruction "Audit the streets and find all the accessibility attributes". Below the image is a "Google" logo and copyright information. To the right of the street view is a sidebar with "Current Neighborhood" (Adams Morgan (East), D.C.), "Current Mission" (Audit 500ft of this neighborhood, 0% complete), and a list of accessibility attributes: 0 curb ramp, 0 missing curb ramp, 0 surface problem, 0 obstacle, and 0 other. Below the sidebar is a map with a red line and a yellow pin, with the instruction "Follow the red line". On the left side of the interface, there are "Sound", "Jump", and "Feedback" buttons. At the bottom, there is a footer with the text "Project Sidewalk is designed and operated by the Makeability Lab at the University of Maryland" and "Version 4.3.8 | Last Updated: 2017-12-26".

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

1 billion people worldwide
15% of the population

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

50 million people in US

Our abilities change
over time and age

**Diverse participation is
critical in effective design!**