

# CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 13:  
Accessibility

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Tuesday/Thursday  
10:30-11:50

# 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

This is a really complicated issue

But it is not new

We will start here

Then work through more obvious problems



# 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 callouses 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  
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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

Designed a model that would appeal to women

Their solution was a smaller version of the iPod in 5 different colors

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




# Differences and Preferences

[Our Experiments](#) [Findings & Data Sets](#) [Blog](#) [For Researchers](#) [About Us](#) English ▾

 **LABINTHEWILD**

**232**  
participating countries




**[Your Title Here]**

### What will next study be called on LabintheWild?

Come up with future study slogans for LabintheWild and see where in the world your fellow contributors are from! This will take around 5 minutes.


[Participate now!](#)



### How accurate is your peripheral vision?

Are you curious about how accurate your peripheral vision is compared to others? Learn more about your visual perception by doing these fun tasks! This test takes around 8 minutes.

[Participate now!](#)



### What is your privacy profile?

Find out how your data sharing behavior compares to others and learn about the Internet of Things. This study takes around 10 minutes.

[Participate now!](#)

# 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

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

50 million people in US

Including yourself if you  
are fortunate to live to  
develop disabilities

# A Social Justice Problem

1 billion people  
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15% of the population

16% of people in the US

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50 million people in US  
Are we reinforcing this or are we  
working against this?

Including yourself if you  
are fortunate to live to  
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# 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, 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



# 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

	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



# 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



Slide Rule, Kane et al, ASSETS 2008

Apple VoiceOver

# Equal Access to Information

Is this access equal?

# Equal Access to Information

Is this access equal?

Some dimensions to consider

Cost

Speed

Accuracy

Ease

Simply being possible is not enough

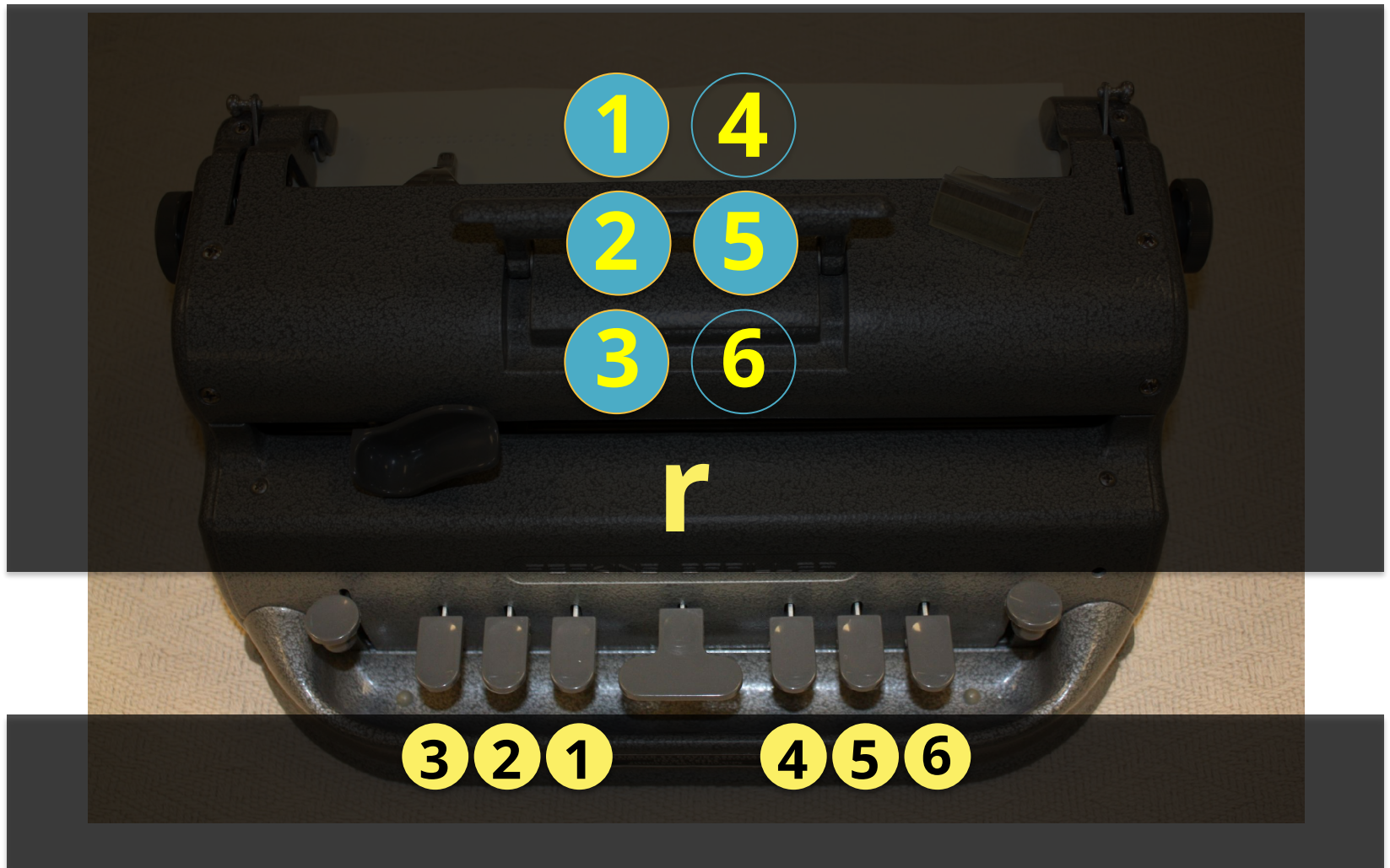
# A Closer Look at Text Entry



# Contrast with Braille Input



# Contrast with Braille Input



# 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



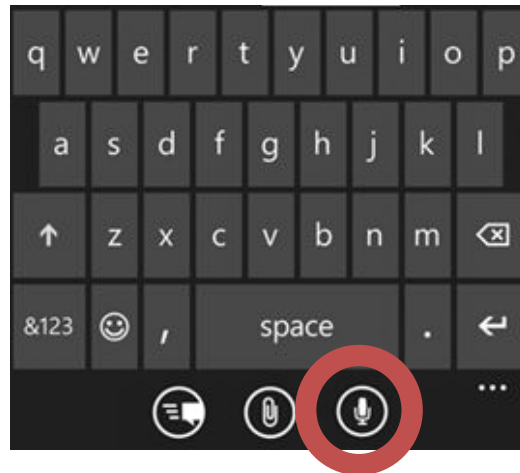
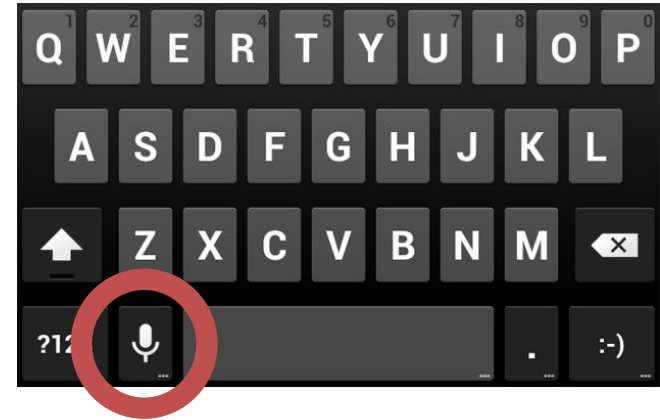
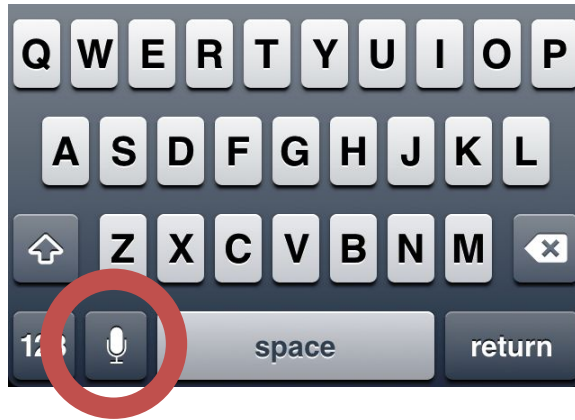
# Perkinput



# Perkinput



# Speech Input



# Accessibility is More than Text Entry

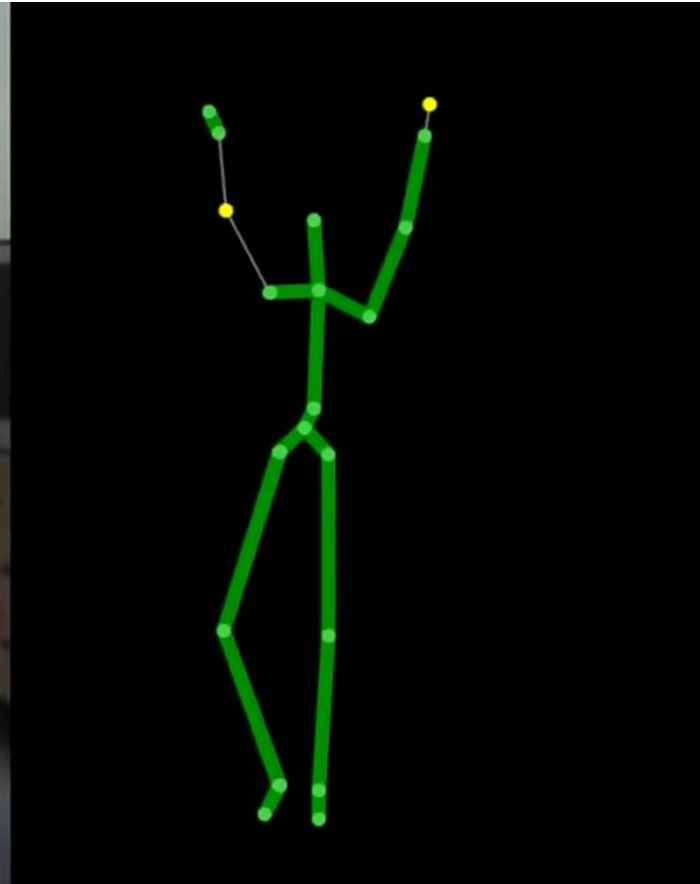


“Sometimes you don’t follow along as well unless [you are] one on one.”

# Accessibility is More than Text Entry



# Accessibility is More than Text Entry



# Accessibility is More than Text Entry



## OneBusAway

Home

Tools

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### NW MARKET ST & BALLARD AVE NW

Stop # 18120 - E bound

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

Project Sidewalk - [projectsidewalk.io](https://projectsidewalk.io)



# Accessibility is More than Text Entry

Project Sidewalk - [projectsidewalk.io](http://projectsidewalk.io)



[Retake tutorial](#)

[FAQ](#)

[Sign in](#)

Find and label the following

Explore Curb Ramp Missing Curb Ramp Obstacle in Path Surface Problem Other

Zoom In Zoom Out Undo Redo

Current Neighborhood  
Adams Morgan (East), D.C.  
0.0 miles 0 labels

Current Mission  
Audit 500ft of this neighborhood  
0% complete

0 curb ramp	0 obstacle
0 missing curb ramp	0 other
0 surface problem	

Audit the streets and find all the accessibility attributes

Do you see any unlabeled problems? If not, Turn slightly towards left

© 2018 Google | Terms of Use | Report a problem

Map data © 2018 Google | Terms of Use

Sound

Jump

Feedback

Project Sidewalk is designed and operated by the [Makeability Lab](#) at the [University of Maryland](#)  
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.

...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  
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15% of the population

50 million people in US

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

“Entrepreneurs ... tend  
to start businesses to  
solve their own problem”

Diverse participation is  
critical in effective design

# A Basic Tenet of Design

You are not designing for yourself

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

We need diversity in who is doing design

As a field, our work suffers because of this failing

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Ashish Chaudhary



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