



CS377Q: Today's goals

- Reflect on A1
- Introduce common assistive technologies/approaches
- Making work accessible (A2)
- Training for disability simulation (A3)
 - Low vision
 - Wheelchair mobility

Class update

- 19 students
- 1? student turned in A1 without a course application
- Encourage scheduling 15-minute Office Hours slot with me by April 19
 - <https://calendly.com/johntang> for slots Wed or Friday afternoon
 - Email: johntang@microsoft.com if you want to find another time

Reviewing A1

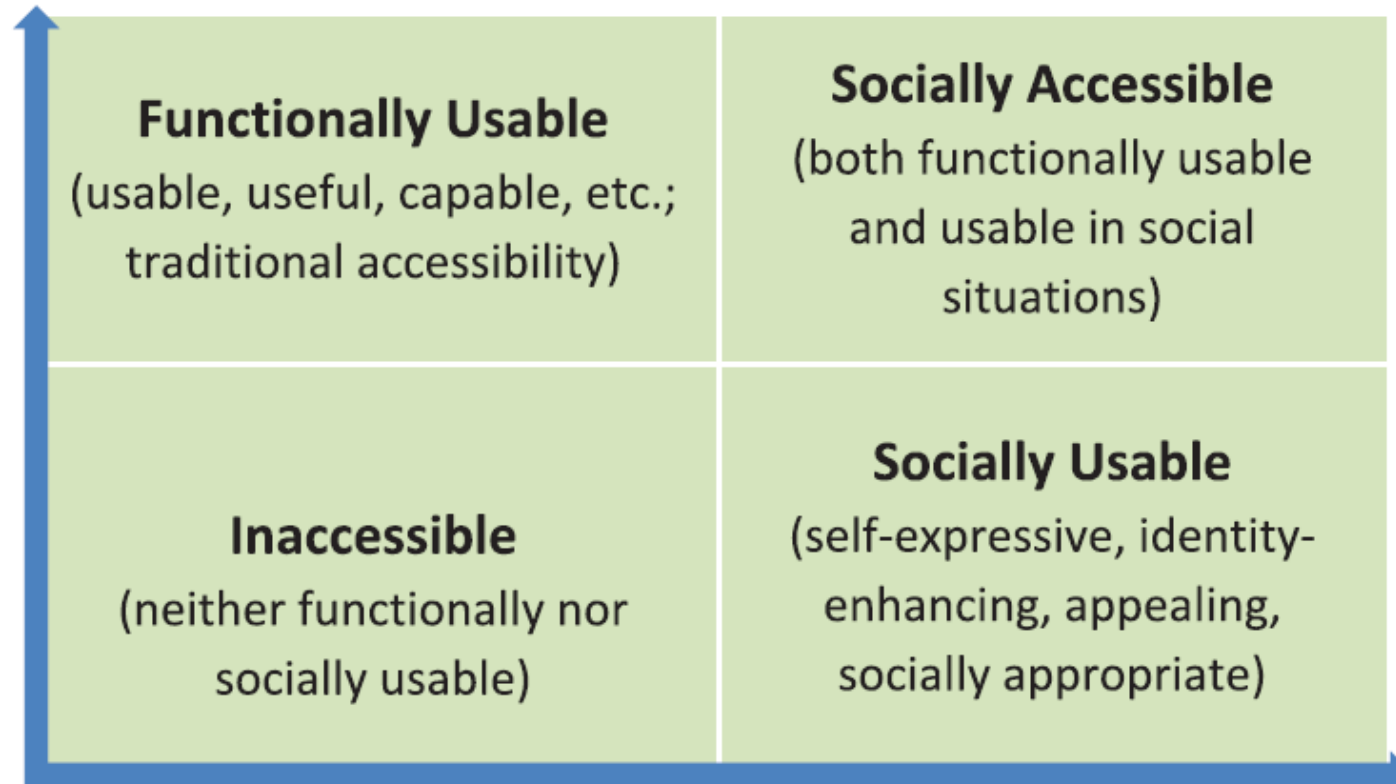
- What kinds of accessibility aids did you observe?
- How effective was the aid in addressing the user's **functional needs**?
- What **social acceptability factors** did you identify?

Design for Social Accessibility Framework



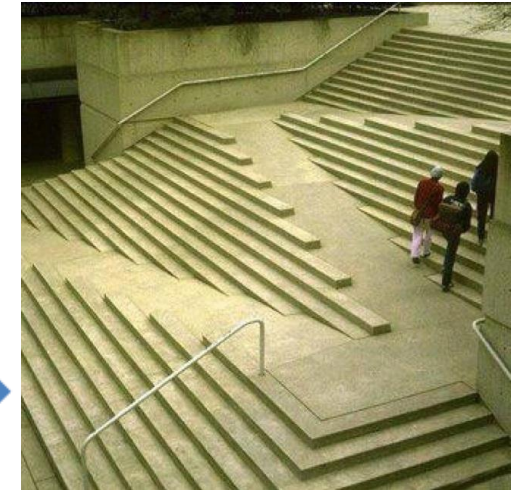
Functional Axis

(ability to meet functional requirements)



Social Axis

(ability to project desired identity and positively facilitate
social interactions and situations)



Tenets for Social Accessibility: Towards Humanizing Disabled People in Design

<https://faculty.washington.edu/wobbrock/pubs/taccess-18.pdf>

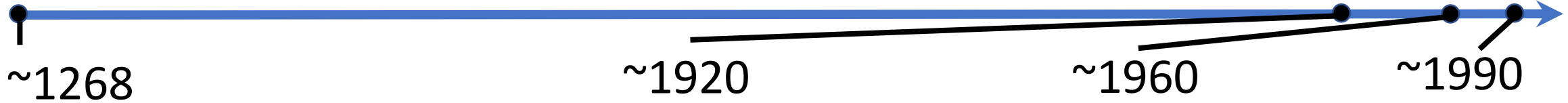
Complementary approaches

- Assistive technologies: created only for people with disabilities to use
- Accessible technologies: usable by people with and without disabilities

Assistive technology trajectory

Invention

Mainstream

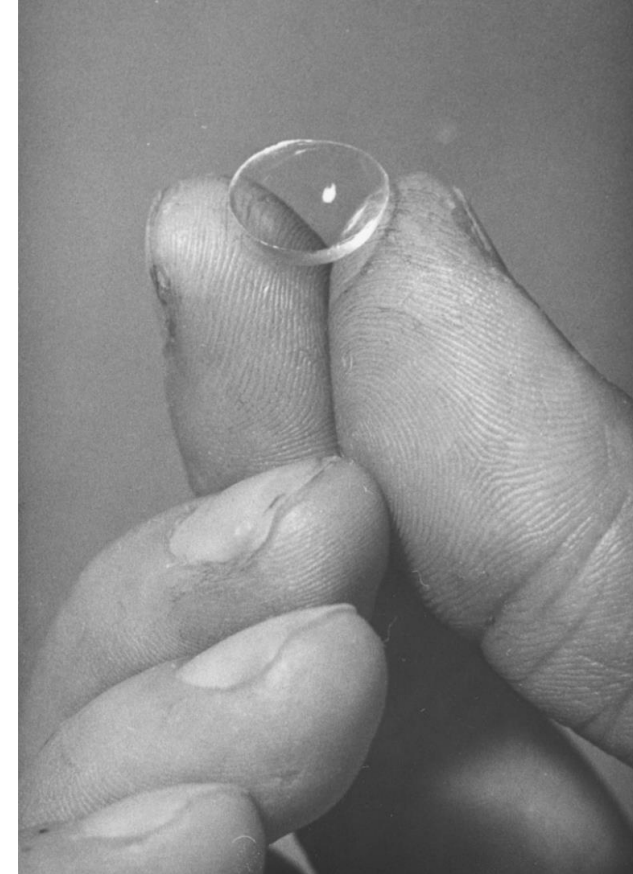


~1268

~1920

~1960

~1990



Common assistive technologies

- Sensory substitution

- Screen reader
- Braille display
- Voice recognition
- Captioning
- Feeling Sounds, Hearing Sights

<https://cacm.acm.org/magazines/2018/1/223884-feeling-sounds-hearing-sights/abstract>

- Ability alternatives

- Wheelchairs, crutches
- Switches
- Eye/head control
- Substituting a different control mechanism

Examples: Apple <https://www.youtube.com/watch?v=XB4cjbYywqg>



Example: Eye tracker https://www.youtube.com/watch?v=Y7_f-pR8SBY



Automatic captioning

- Voicemail automatic captioning
- Hi John, my name is Name: Rudwala and I'm calling from omnilab we are uh robotic telepresence company, based out of Silicon Valley and we actually were already work with Microsoft. With another team and I notice that you were using Beams for connecting with other researchers across the Globe and very interestingly. I see that you also do human computer human computer interactions. We have a developers edition. That's used in research labs.



PowerPoint automatic captioning

- Demo in real-time (Slide Show + Always Use Subtitles)
- Basis for translation in real-time
- Also used in Skype video calls (including translation)

Accessible tech: Speech recognition



Optical character recognition: Assistive → Accessible



Microsoft
Office Lens



Text fairy

Sensory substitution: Straightforward?



Sensory substitution: Straightforward?

$$\frac{27 + (3 \times 8) - 9}{(21 / 3)} = 6$$

Sensory substitution: Screen reader

- Microsoft Narrator (Win + Ctrl + Enter)
 - CapsLock + R to read
 - Tab to advance
 - CapsLock + R to read
 - CapsLock + + to increase speed
 - Ctrl to stop
- Word Document
- PowerPoint Document

The importance of order

Knock knock.
Canoe.

Who's there?
Canoe who?



Canoe help me with my homework?

The importance of order (fixed)

Knock knock.
Canoe.

Who's there?
Canoe who?



Canoe help me with my homework?

AutoSave On


HCIC2... - Saved

Search

John Tang

FileHomeInsertDrawDesignTransitionsAnimationsSlide ShowReviewViewHelp

SpellingThesaurus

Check Accessibility

Smart Lookup

TranslateLanguage

New CommentDeletePreviousNextShow Comments

Compare

Hide Ink

Linked NotesOneNote

ProofingAccessibilityInsightsLanguageCommentsInk

20

21

22

23

24

25

26

27

Stream view duration (seconds)

25%	50%	75%	100%
4.5	18.8	86.2	3314.71 (55.2 min)

Average: 96.9 secs

- Skewed distribution
 - Many very short “glances”
 - Most of the time spent in long “watches”

Slide 24 of 49

NotesDisplay Settings

60%

AutoSave On

HCIC2... - Saved

Search

John Tang

FileHomeInsertDrawDesignTransitionsAnimationsSlide ShowReviewViewHelp

SpellingThesaurus

Check Accessibility

Smart Lookup

TranslateLanguage

New CommentDeletePreviousNext

Show Comments

Compare

Hide Ink

Linked Notes

ProofingAccessibilityInsightsLanguageCommentsInkOneNote

20

21

22

23

24

25

26

27

28

29

30

Stream view duration (seconds)

25%	50%	75%	100%
4.5	18.8	86.2	3314.71 (55.2 min)

Average: 96.9 secs

- Skewed distribution
 - Many very short “glances”
 - Most of the time spent in long “watches”

It would be interesting to compare this with viewing time in Periscope or FB Live

Accessibility Chec..

Inspection Results

Errors

- Missing alternative text (50)
- Table has no header row (1)
- Missing slide title (18)

Warnings

- Use captions for audio and video (4)
- Check reading order (26)

Tips

- Duplicate slide title (2)

☐ Keep accessibility checker running while I work

Additional Information

[Read more about making documents accessible](#)

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NotesDisplay Settings

44%

abc ✓ Check Document

📖 Thesaurus

📊 Word Count

Proofing

Read
Aloud

Speech

Check
Accessibility

Accessibility



Language



Comments



Tracking



Accept

Changes



Compare

Compare



Protect



Ink



Resume

Linked
Notes

OneNote

hospital/health clinic

- senior center
- high volume public places (shopping center, public squares, etc.)

If you want to describe an example from the past that you vividly remember from personal experience, you can do so by providing a sketch of the example.

In addition to the picture, use a few paragraphs of text to describe their use of the accessibility aid. Include:

1. What was the accessibility aid and how was the person using it to support their activity?
2. How effective was the aid in supporting the person's functional needs?
3. Did people interacting with the person notice or interact with the aid device?

Part 2 (2 points)

Then read "In the Shadow of Misperception: Assistive Technology Use and Social Interactions"

<https://faculty.washington.edu/wobbrock/pubs/chi-11.03.pdf>

In your own words, describe the concept of "social acceptability" developed in the paper. Add a couple paragraphs discussing whether the design of the accessibility aid you observed affords good social acceptability, explaining why or why not.

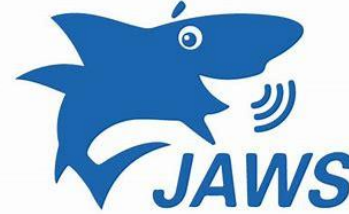
Part 3 (1 point)

Office accessibility training

- <https://aka.ms/OfficeAccessibility>
- <https://support.office.com/en-us/article/make-your-word-documents-accessible-to-people-with-disabilities-d9bf3683-87ac-47ea-b91a-78dcacb3c66d?ui=en-US&rs=en-US&ad=US>
- <https://support.office.com/en-us/article/make-your-powerpoint-presentations-accessible-to-people-with-disabilities-6f7772b2-2f33-4bd2-8ca7-dae3b2b3ef25>

Other popular screenreaders

- Windows: JAWS (Job Access With Speech)



- Apple: VoiceOver



- Android: Talkback



A2 (4 points)

1. Use Microsoft Office Accessibility Checker to help make the following Word document accessible for a screen reader
2. Use Accessibility Checker to help make the following PowerPoint document accessible for a screen reader
3. Run Accessibility Checker on a file that you authored and edited in PowerPoint
 1. Some complexity (figures, images, tables)
 2. If you don't use PowerPoint, find a publicly shared one
 3. Snapshot Inspection Results, identify a problematic slide, comment
4. Reflect on what is the biggest challenge and how technology could improve the process of making files accessible

Due before class, April 9

Looking ahead

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		2 A1 assigned	3	4 A1 due A2 assigned A3 training in class	5	6
7	8	9 A2 due A3 exercise in class	10	11 A3 due A4 assigned	12	13
14	15	16 A4 due	17	18	19	20

- A2: Making work accessible (individual)
- A3: Disability Simulation—pairs: low vision or wheelchair (open to alternatives)

A3: Disability simulation (12 points)

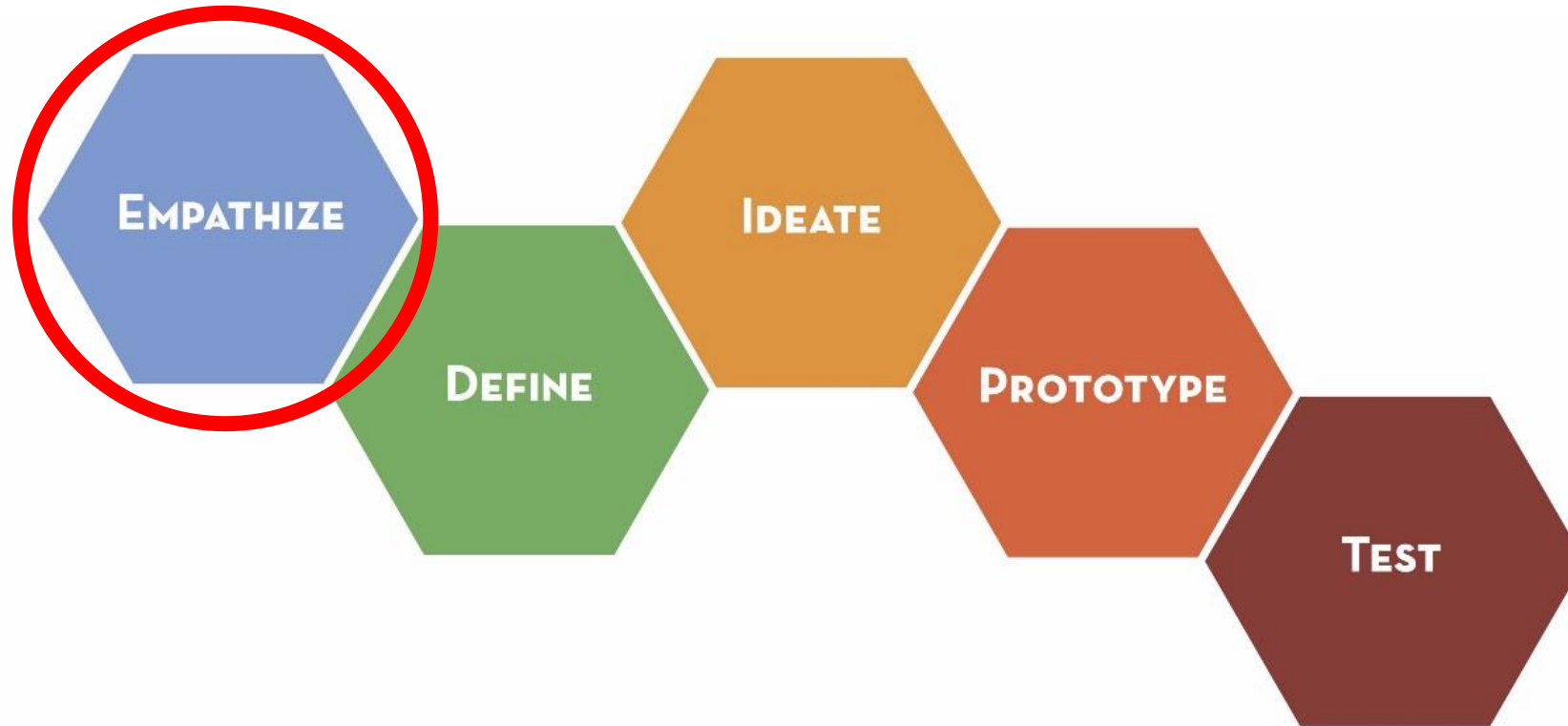
- Living with a disability for 30 minutes, accomplish a task
 - Low vision (ranging from blind to no focal vision)
 - Wheelchair
- Pairs
 - Simulant
 - Safety partner
 - Switch roles
- Done during class period, Tuesday, April 9
- Training today

Break

- Find partner for A3
 - Pick which kind of disability you'd like to explore
 - If prone to vertigo or dizziness, avoid low vision conditions
 - Calibrate on comfort zone
 - Max of 5 pairs for wheelchair mobility
 - Let us know if you're absent for Tuesday, April 9
 - Register pair at:

<https://tinyurl.com/CS377QDisabilitySimPairs>

Disability simulation



A3: Disability simulation overview

- Today: Training specific to disability
 - Low vision: Various levels, how to use a cane, how to guide someone who is blind
 - Wheelchair: How to navigate, open doors, transfer using manual wheelchair
- Tuesday: Run simulation during class
 - Given a task to perform (variation)
 - Round 1: 30 minutes, task to navigate out
 - Round 2: Switch roles, 30 minutes, task to navigate back
 - Document experience through pictures (safety partner, stop moving)
- **Must stay in disability character** outside of classroom
 - Switch roles out of public view

A3: Safety partner's role

- The *safety partner's* primary and crucial job is to assure the safety of the *simulant*
 - anticipate possible hazards in the environment
 - prevent the *simulant* from getting into dangerous situations
- **This is not a Bird Box Challenge!**
- Except as instructed regarding the *simulant's* safety, the *safety partner* should avoid **initiating** help to the *simulant*
- Help document by taking pictures (stop, take photos appropriately)
- If people challenge or disrupt simulation, explain that it is a class exercise, direct them to contact me as instructor: johntang@microsoft.com

A3: Submit

- Share all the photos you took with each other
- Tuesday April 15: Submit reflection
 - Describe experiences as simulant
 - Describe experiences as safety partner
 - Illustrate with pictures
 - Reflect on how this experience influences your empathy with people with this disability
- A4 will ask you to reflect on the experience from another perspective

Training

- Some tasks involve purchasing something
- Wheelchair (max 5 pairs)
- Low vision (resource for serving as a human guide on Canvas:
<https://canvas.stanford.edu/courses/101502/files/4376270/download?wrap=1>)
- Must be **even** number of students in each group
- Pair up by the end of today, register pair at:
<https://tinyurl.com/CS377QDisabilitySimPairs>
 - Use Piazza to find a pair if necessary