

Assignment #2: POVs and Experience Prototypes

Studio: Assistive Technologies and Accessibility
Team 1

The Audio Reality Team



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We're investigating how hearing loss affects people's lifestyles inside and outside the classroom.

Initial POV

We met J...

a 21 year old college student who is fiercely independent and wants to travel.

We were amazed to realize that...

he has to wait several days and travel over an hour during a school day in order to be seen by an audiologist who is licensed for his hearing aids.

It would be game-changing...

if J's hearing aid issues didn't disrupt his life.



Needfinding, Part II

Interview #1: MO

“People don’t know about deaf people.”

“When I call into businesses, if the relay is **too slow** or they realize I’m deaf they will sometimes *hang up the phone.*”



Interview #1: MO • POV #1

We met...

MO, an activist and deaf substitute teacher, who is very frustrated with how hearing people treat deaf people.

We were amazed to realize that...

people would hang up on her if she was not talking fast enough or if they realized that she was deaf.

It would be game-changing to...

enable deaf people to communicate at the same speed as hearing people.

Interview #1: MO • POV #2

We met...

MO, a deaf teacher and community leader who relies on her phone to communicate with most hearing people.

We were amazed to realize...

how often interpretation wasn't present when it was needed most—in emergency medical situations.

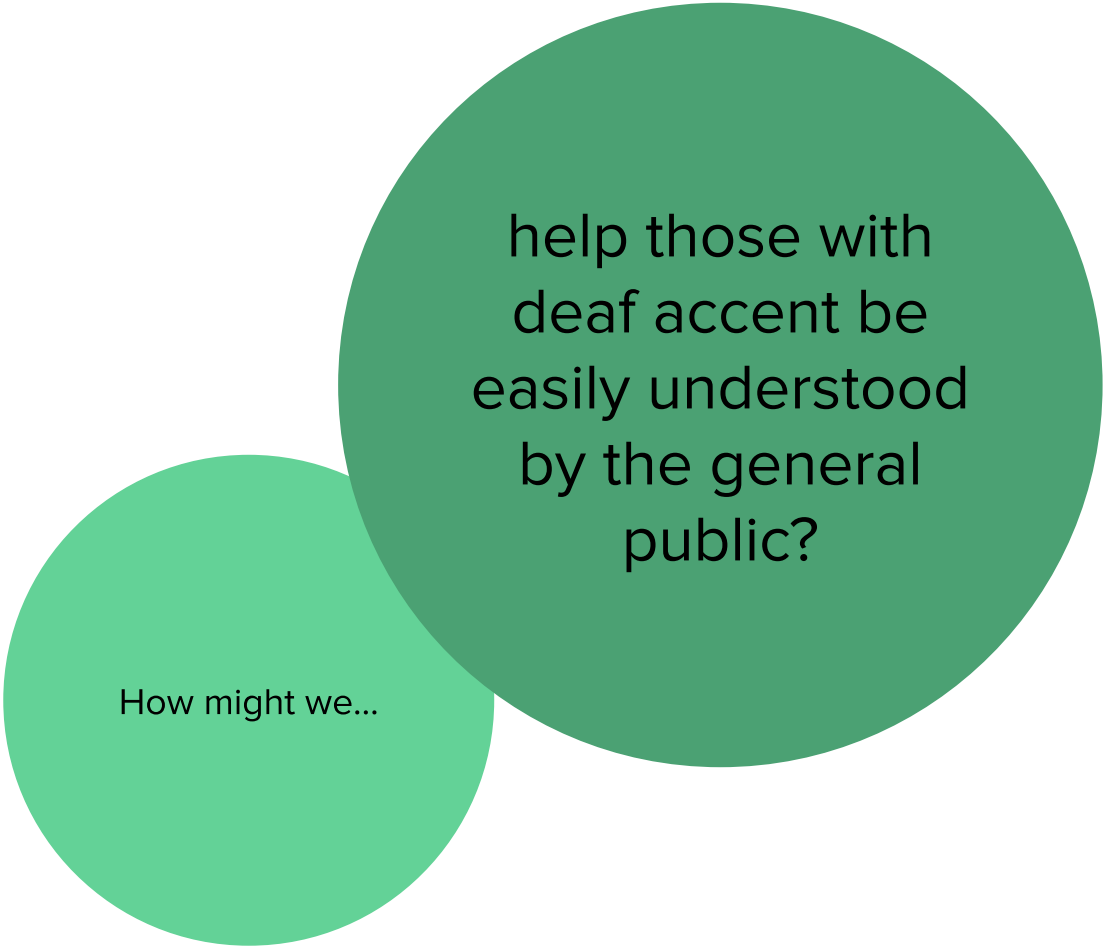
It would be game-changing to...

make sure MO could always communicate via her preferred method (ASL).



How might we...

make emergency
services
accessible for
deaf people?



help those with
deaf accent be
easily understood
by the general
public?

How might we...

Interview #2: TP

“I don’t know ASL.”

“I used to have an FM system that I gave to the professor, but I don’t have time for that...passing periods are short.”

Enjoys going to movie theaters with AR captions –
Sony glasses.



Interview #2: TP • POV #3

We met...

TP, a deaf activist on campus who dislikes special attention.

We were surprised to realize...

that he didn't feel comfortable asking professors to wear a bluetooth microphone during lecture.

It would be game-changing to...

allow him to understand lecture perfectly without the professor ever being aware of his hearing impairment.



How might we...

make lecture like
reading a book?

Interview #3: SM

“Men, they
throw them in
the trash”



“Better than not
hearing”

Interview #3: SM • POV #4 (bonus!)

We met...

SM, an older Menlo Park resident who is invested in her social circle that also uses hearing aids.

We were surprised to realize that...

ambient noise is the largest of her concerns with her hearing aid.

It would be game-changing if...

all non-relevant noise would be eliminated.

Experience Prototypes & Testing

Prototype #1: Auto-captioning lectures with AR

Assumption

Students will be able to follow lecture with **captions** held in their field of vision.

Prototype

Student A gave a math lecture

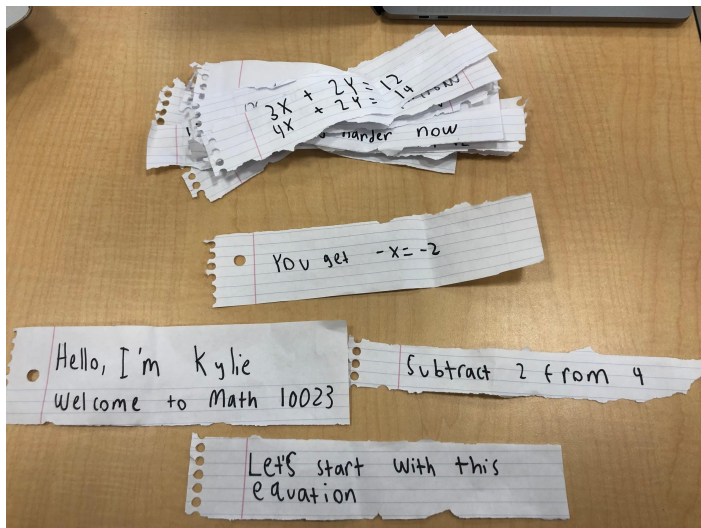
Student B saw **paper captions** in their field of view

Response

“Worked fine”; “Math is complicated but I was able to keep up”

Automatic captioning is faster than manual, which is “reflected in this prototype”

Prototype #1: Auto-captioning lectures with AR



Paper captions displaying spoken text



Our participant looking at paper captions while watching the lecture

Prototype #2: Student collaborative live captioning

Assumption

Students are able to transcribe speech in real-time with high accuracy.

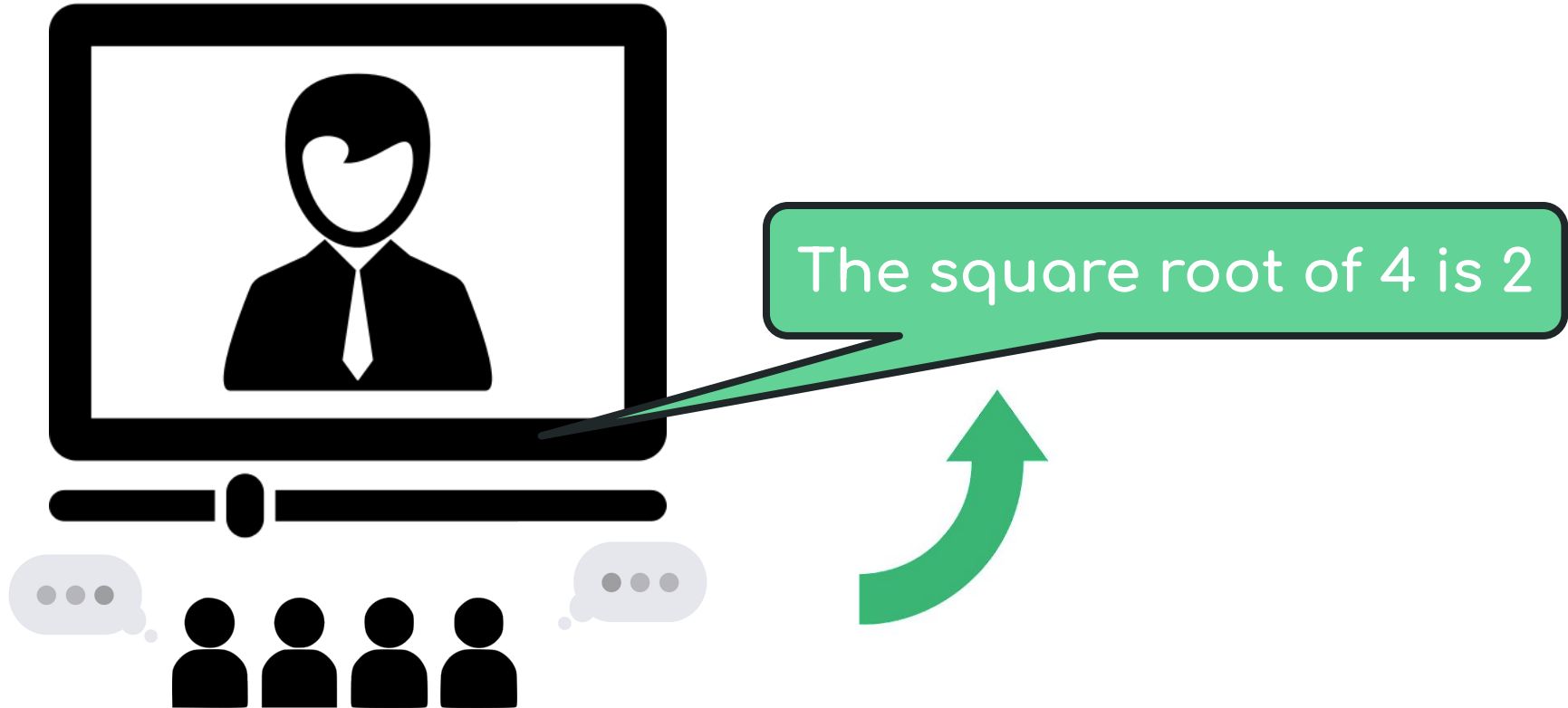
Prototype

We watched a video with another student and collaboratively transcribed it.

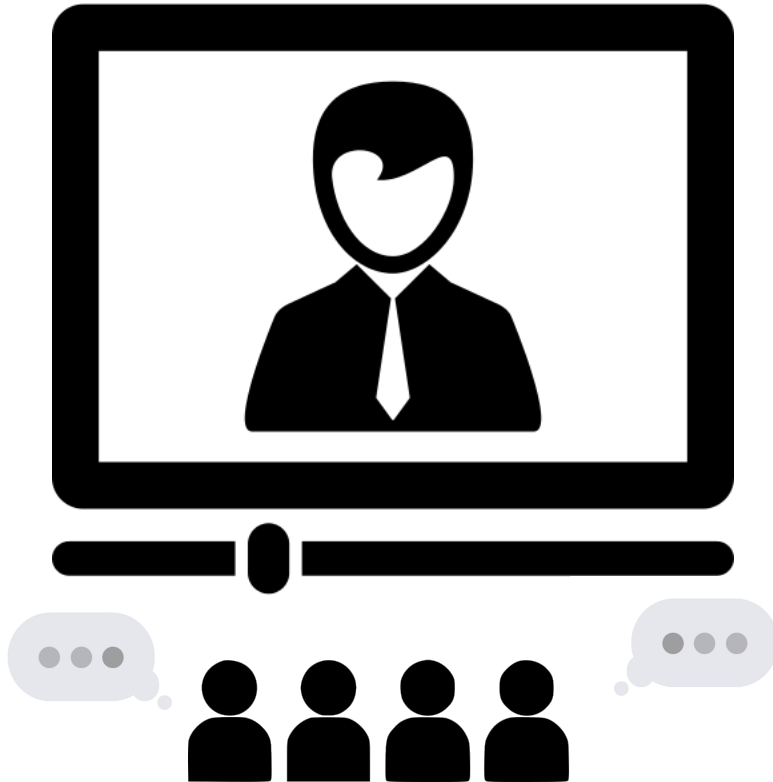
Response

“Students can’t type 150 words per minute like a stenographer”

Prototype #2: Student collaborative live captioning



Prototype #2: Student collaborative live captioning



- ★ Designable
- ★ Effective
- ★ Typing > Writing

- ★ Already exists in classes
- ★ Typists > Students
- ★ Low accuracy

#3 ASL-erate

- Met a non-stanford student from Germany, O.
 - They **aren't** hard of hearing.
 - They don't know **ASL**.



Prototype #3: Live ASL recognition to text

Assumption

People often found communication with deaf people difficult because they were not fluent in ASL.

Prototype

We signed a sentence in ASL and simultaneously presented text based captions.

Tested with O, a non-student from Germany.

Response

“It would definitely help with communication”

“It is the deaf person’s responsibility to help others understand them”

Experience Prototype 3 - ASL-erate



- ★ **Convenient** if non-ASL speaker
- ★ **Standardized** language
- ★ **Unfamiliarity** with ASL
- ★ **Complex** technology

Summary & Key Learnings

Interview realizations:

- Some view it as the responsibility of the deaf to be understood
- “People don’t know about deaf people”
- People are very rude to deaf people

Chosen solution:

- Converged to solution of auto-transcribing lectures with smart glasses

Appendix

Empathy Maps

HMWs and solution brainstorming

Voted HMW statements:

1. HMW allow folks with deaf accent to be clearly understood by everyone around them
2. HMW make emergency services accessible for deaf people
3. HMW make lecture like reading a book

2019/10/10 S interview empathy maps

<p>Say</p> <ul style="list-style-type: none"> • "A salt drop sounds like an explosion" • "They aren't perfect" • "I can hear them cooking the food" • "Men have tried them and they end up in the garbage can" • "Audiologists do the dirty work...ear wax" • "It's better than not hearing" • "The brain gets used to it" • "My friend likes to sit against walls when in restaurants." • "Troubles with hearing aid are better than only hearing parts of a conversation." • "I can't read as fast" 	<p>Do</p> <ul style="list-style-type: none"> • She forgets her hearing aid is in • Is in social environments • Has mutuals that use hearing aid • Took some time to adjust to her hearing aid • Got her hearing aid through insurance • Charges her hearing aids at night. • Uses hearing aids regularly. • She uses implants. • Controls her device using a remote control. • Promotes hearing devices to her friends.
<p>Feel</p> <ul style="list-style-type: none"> • Content • Bothered • Optimistic • Ease • Calm • Composed • Social • Humorous • Informed • Experienced • Knowledgeable • Treated well by Audiologists 	<p>Think</p> <ul style="list-style-type: none"> • Ambient noise is too loud • Users should adjust to their hearing aids • Hearing aid can be too noisy • Hearing aids should deaden the excess noise • Hearing aids should have volume control • The magic solution to hearing aids is only picking up things one is focused on. • Males don't want to use hearing aids • One can adjust to the loss • Hearing aids don't have much room for improvement • Public spaces should provide more hearing friendly seating

2019/10/09 TP interview empathy maps

<p>Say</p> <ul style="list-style-type: none"> • "College is better than high school socially. People are willing to repeat themselves, they don't get as frustrated." • "If a classroom doesn't have a front (i.e. language/seminar classes) it's very hard to hear" • "I have a hard time in language classes, and it affects my language learning" • Magic wand: not completely sure, would be nice to have hearing aids connect to PA systems in class. <ul style="list-style-type: none"> ◦ "That would be a good start" • Cost is a barrier to easy access to hearing aids • When traveling, have to order hearing aids from the US • Takes a long time to get hearing aids from insurance when abroad • Took four weeks, and then they were the wrong hearing aids • Used to ask profs to hook up a special microphone, but it takes too much time and he doesn't have time • Enjoys going to edwards cinema bc of their AR glasses • Working on getting closed captioning into lectures, voice to text 	<p>Do</p> <ul style="list-style-type: none"> • Engaged normally • Tilted one ear towards us • Hearing aid in one ear • Spoke slowly • Took off glasses when speaking to us • Gestured often • Sat farther away, pointed out how we were able to communicate normally despite this • Didn't ask us to repeat ourselves • Didn't seem to have any trouble hearing/understanding us • Spoke softly • Pulled out phone to show us google live transcribe
<p>Feel</p> <ul style="list-style-type: none"> • Frustrated about asking people to repeat themselves • Insecure about asking people to repeat themselves 	<p>Think</p> <ul style="list-style-type: none"> • I don't want to bother other people • I can make do • I want to make being at stanford as easy for people with hearing impairments as possible • I will work with the school and other entities to find non-invasive or obvious accommodations for my hearing impairments

2019/10/08 MO interview empathy maps

<p>Say</p> <ul style="list-style-type: none"> • "If there's no coverage, I can't make calls" • "People don't think" with respect to people talking behind her back • "People don't know about deaf people" 	<p>Do</p> <ul style="list-style-type: none"> • Constantly signing • Frustrated by the speed of texting. Stops texting to talk to us, then switches over to typing when we don't understand • Less personal space occasionally touched interviewer to get attention • Exaggerated facial expression and shrugs when describing problems <ul style="list-style-type: none"> ◦ When people realize she's deaf ◦ Physically shrugs off insults • Mime actions • Pulls out her phone often to reference tech aids <ul style="list-style-type: none"> ◦ Uses many different apps, including apps with the same function • Was having Kylie try the apps with her to demonstrate how slow and not useful they were
<p>Feel</p> <ul style="list-style-type: none"> • Anger • Frustration • Hurt on behalf of others • Incredulity • Pride • Resignation 	<p>Think</p> <ul style="list-style-type: none"> • Hearing people don't have patience for deaf folk • Thinks hearing people are rude or inconsiderate • She thinks people don't think about deaf folks • She thinks she doesn't want to live without limits • Thinks captioning resources aren't put into open captioning as with closed captioning

HMW statement generation

POV #6

- **We met** MO, a deaf teacher and community leader who relies on her phone to communicate with most hearing people
- **We were amazed to realize** how often interpretation wasn't present when it was needed most—in emergency medical care situations
- **It would be game-changing** to make sure MO was never without the ability to communicate with her preferred method (almost always sign language)
- HOW MIGHT WE statements:
 - HMW create a 911 for deaf people
 - **HMW make emergency services accessible for deaf people**
 - HMW allow doctors to diagnose their patients without needing to talk to them
 - HMW make sign language a universal second language
 - HMW we use sign language users nearby in an emergency
 - HMW make the bay area more attractive for interpreters
 - HMW allow for sign language communication without interpreters
 - HMW get every doctor and nurse to sign
 - HMW increase the number of interpreters per hospital
 - HMW connect interpreters from far away with those who need translation
 - **HMW allow deaf folks who have trouble speaking actually understood by the general public (i.e. can we allow them to produce understandable English)**
 - HMW increase cellular coverage for IP relay

POV #1 J

We met J, a 21 year old college student who is fiercely independent and wants to tr

We were amazed to realize that he has to wait several days and travel over an hour during a school day in order to be seen by an audiologist who is licensed for his hea aids

It would be game-changing if J's hearing aid issues didn't disrupt his life.

HMW:

1. Bring the audiologist to J
2. Allow J to be independent when fixing his hearing device
3. Bring audiologists to school
4. Make it okay if J can't make it his audiologist
5. Make hearing aid maintenance less stressful for J
6. Share J's experience with people in his area
7. Allow J to be seen for his hearing aid digitally
8. Remove the disparities in licensing audiologists
9. Allow J to see the audiologist on the weekends
10. Shrink the distance needed to see an audiologist
11. Ensure an audiologist is always available on call
12. Ensure J has enough hearings available to him and extras to carry him through emergencies

POV #5

- **We met** MO, an activist and deaf substitute teacher, who is very frustrated with how hearing people treat deaf people.
- **We were amazed to realize that** people would hang up on her if she was not talking fast enough or if they realized that she was deaf.
- **It would be game-changing** to enable deaf people to communicate at the same speed as hearing people.
- HOW MIGHT WE statements:
 - **HMW make using sign language and relays fun for everyone involved.**
 - HMW get hearing people to use sign language and learn it fluently
 - HMW slow down conversations
 - HMW teach hearing people patience
 - HMW make a conversation like a stroll instead of a sprint
 - HMW create a faster input mechanism for computers that's as accurate as typing
 - HMW make voice unnecessary to her life
 - HMW make all business-consumer interaction voiceless
 - HMW normalize complex text conversations
 - HMW increase the patience of hearing people
 - ~~HMW create a new communication platform tailored specifically to communicating between deaf and able-hearing folks~~
 - HMW eliminate the need for communication between individuals
 - HMW crowdsource the interpretation of sign language in the Sprint Relay
 - HMW increase typing speed for deaf people
 - HMW normalize deafness, or educate people that this exists
 - HMW automatically translate ASL into text and text into ASL

