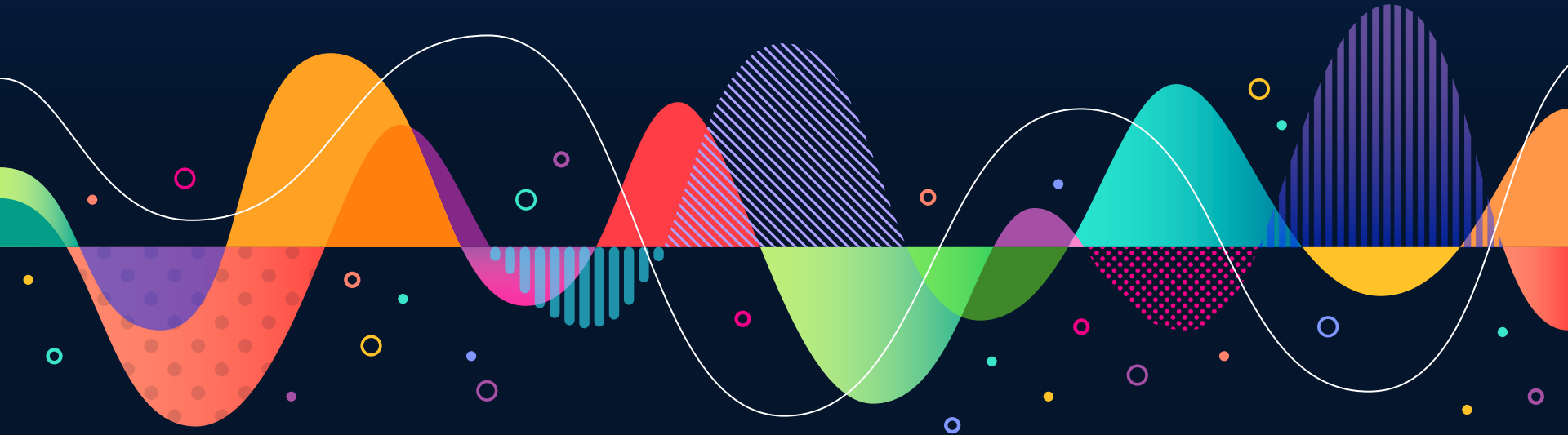# Visual Impairment & Technology

Assignment 1

Jung-Won, Haeli, Dani, and Sydney

Meet Our Team

Sydney Jones

2021, Computer Science - HCI

Danielle Cruz

2021, Symbolic Systems - Learning
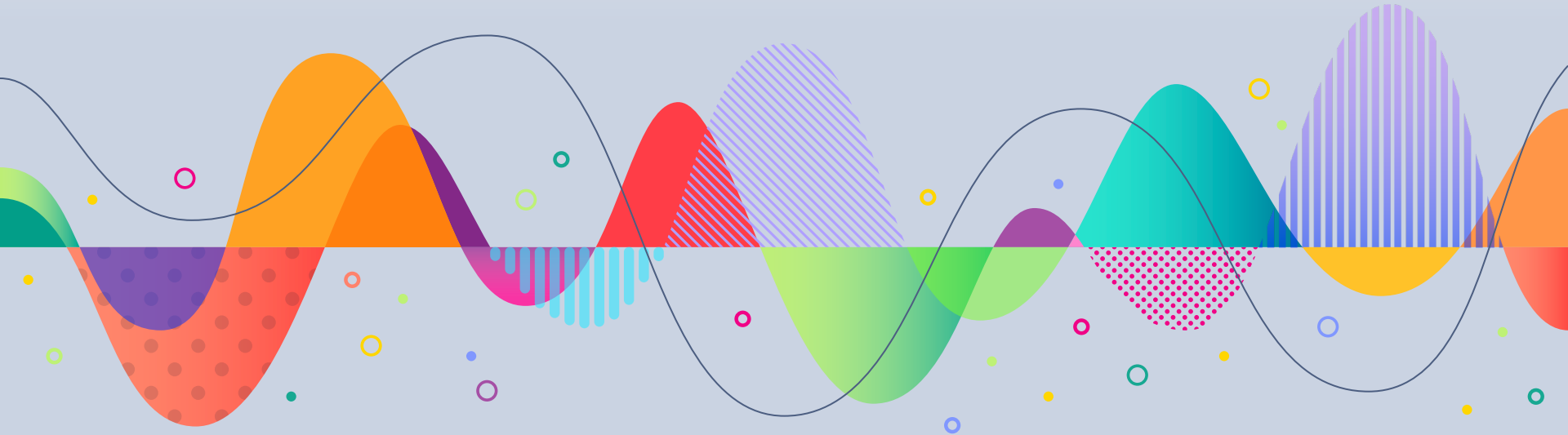
Jung-Won Ha

2021, Computer Science - AI

Haeli Baek

2021, Symbolic Systems - HCI

Project Domain

In what ways do **visually impaired users** interact with technology?

Interview 1

Adrian

Who

Stanford CS graduate (HCI), software engineer, nystagmus in one eye and blind in the other

Why

Perspective of a designer and developer with visual impairment, ample experience interacting with different devices and technologies

How

Emailed for 35-min Zoom chat, not compensated

Interview 2

Michael

Who
Stanford lecturer in CS, visually impaired

Why
Perspective of a developer and engineer, legally blind, born with glaucoma

How
Emailed for a 45-min Zoom chat, not compensated

Interview 3

Patricia

Who

Sydney's grandmother, 79 years old, LOVES emojis

Why

Perspective of older generation, non-technical background, vision loss with age (cataract surgery)

How

Messaged for a 30-min Zoom chat, not compensated

▹ Can you walk me through your typical day and your interactions with technology?

▹ Tell me about a time when technology was really helpful

What Did We Ask?

▹ What about your FitBit made it confusing to use?

▹ Is there any technology you can't use? Why?

▹ Why do you prefer magnification to a screen reader?

▹ What are some frustrations in your daily life?

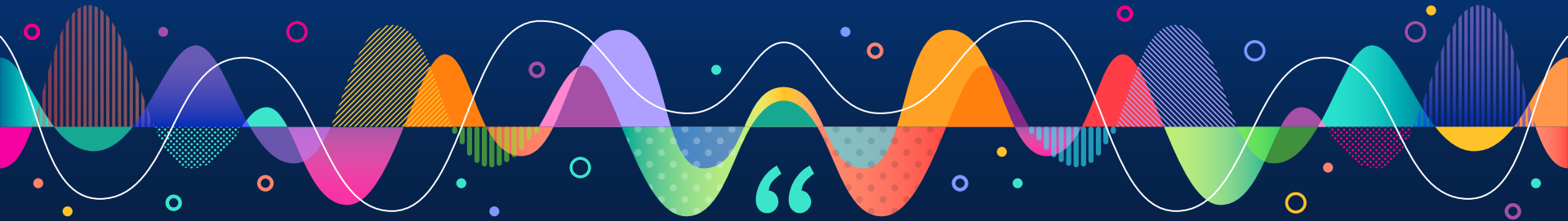▹ Why do you say it's unusual to pair Braille and magnification?

"

Siri is the worst voice assistant of all time.

Adrian
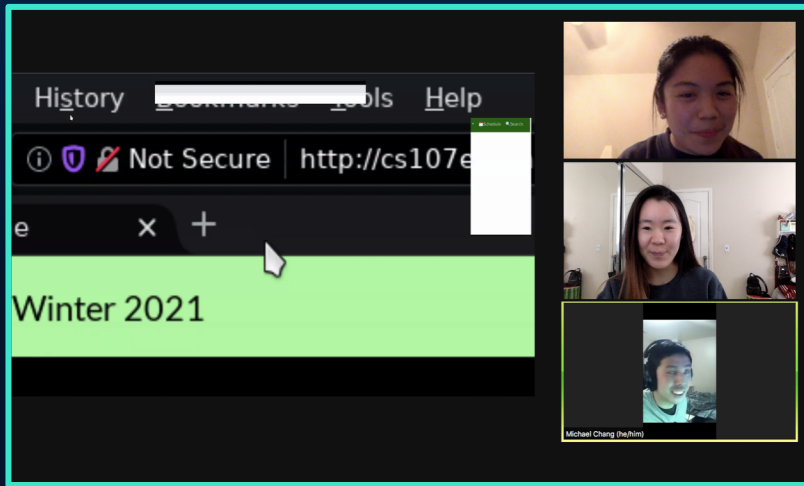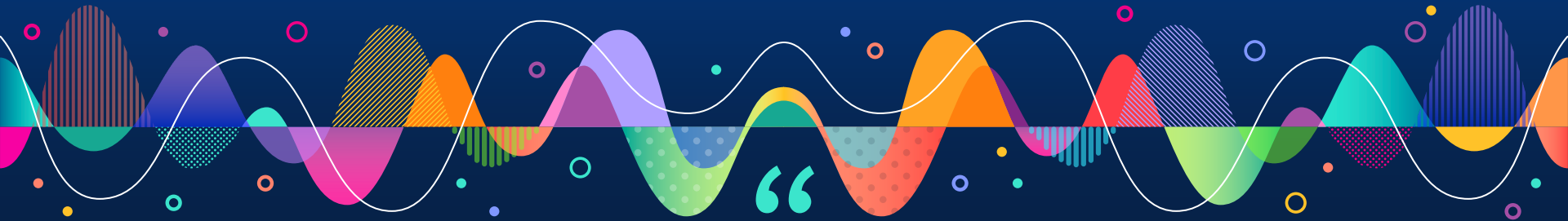
I prefer magnification to a screen reader because I can still interact with images on the screen.

Michael
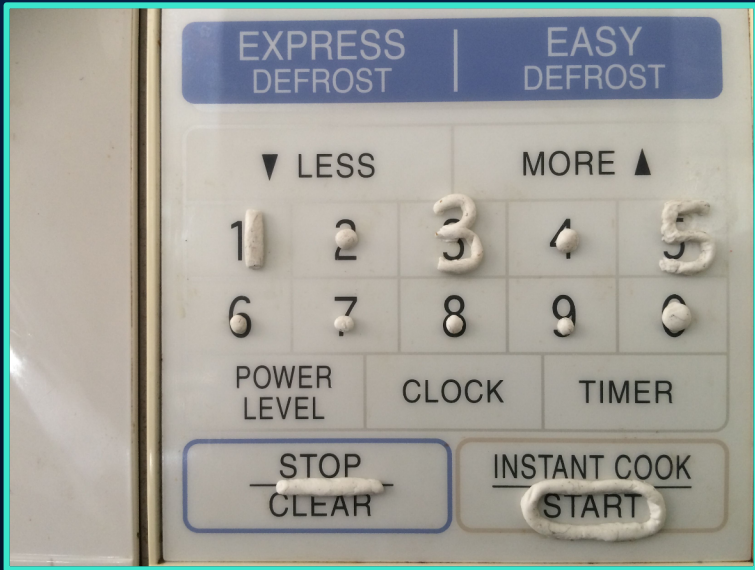
I don't want a microwave that talks to me. I just want a way to know where the numbers are. I want to be able to use the same kind of microwave everyone else does.

Michael

I want to build rapport. I want to engage and that's very frustrating for me socially to not be able to, like, you know, greet people with confidence.

Adrian

Say

Can achieve 'sweet spot' with proper magnification and distance	**Many technologies unnecessarily put users far away from the screen**	Good graphic design makes a huge difference	Touch ID is more reliable than Face ID
Effective use of colors is essential	Intuitive design requires brain to do less work	Magnifier app on iOS is useful	**Siri is the worst of all voice assistants**
Tradeoff between location and accessibility when seeking apartments	Voice assistants can be very helpful for those visually impaired	Busy websites lead to mental cluttering	Inability to confidently perceive people hinders ability to build social rapport

Do

Uses Magnifier app on his phone to see things on his screen

Face was very close to the computer screen throughout interview

Utilizes Magnifier app for close and long distance vision (i.e. reading a menu + crosswalking)

Interviewee described having his chin directly above the touchpad of his laptop

Triple taps his phone screen to open the Magnifier app/Camera

Uses camera to take pictures of the menu at restaurants so he can zoom in later and read it

Constantly adjusting his relative distance and angle to the computer screen to gain focused vision

Manually types in iPhone password instead of using face ID because face ID won't recognize his face close up

Body language was more engaged when talking about frustrations with lack of accessibility in everyday technologies

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Think

Believes good graphic design is very important for increased accessibility	**Utilizing color effectively is an essential, yet underappreciated tool**	Voice assistants can overcome several visual boundaries with a single voice command	The social needs and desires of those visually impaired is not considered enough
Many websites could improve their designs and layouts to be more intuitive	Accessible design needs to become more widely accessible	**Has to consider accessibility when looking for an apartment**	The general population is unaware that there are various forms of visual impairment and needs differ accordingly
Accessible design has a lot of room for improvement	Many technologies unnecessarily put users far away from the screen	Magnifier app on iOS is a very useful, versatile tool	

Feel

Feels frustrated for girlfriend who heavily relies on Siri

Thoroughly pleased by the new magnifier app on iOS

Annoyed by website designs that constantly require him to move back and forth from his screen to re-focus

Hopeful about the future of accessible design

Socially frustrating to not be able to greet people with confidence, hinders ability to build rapport

Feels disappointed that some video game sensors, such as the Wii, require you to be a certain distance away from the screen.

Feels disappointed in the Google Glass, as it wasn't as user-friendly as he initially hoped

Thankful that we took the time to interview him about his unique relationship to technology and ux/ui design

Upset that specialized accessible technology is financially inaccessible

INSIGHT

Even though voice assistants and screen readers can overcome visual boundaries, inaccuracies and losses of interaction can make them less preferable.

NEED

It would be transformative for users to to experience visuals through other senses (e.g. speech) without sacrificing quality or interaction.

INSIGHT

Devices that require people to be a certain distance away from the screen is very inaccessible, especially to those who can only see the screen up close.

NEED

It would be ground-breaking to help all people enjoy personal technologies regardless of their distance from the screen.

INSIGHT

While each person has a different visual impairment and different things that work for them, highly specialized assistive tech can be frustrating in that it seems cut off from the rest of the world.

NEED

It would be game-changing to help users find individualized tools without disconnecting them from more universal, up-to-date technologies.

INSIGHT

A user's relationship to assistive technology may change as their vision changes (e.g. improves with surgery, fades with age).

NEED

It would be revolutionary if there was a way for people's relationships with assistive technology to adapt without having to learn entirely new methods or technologies.
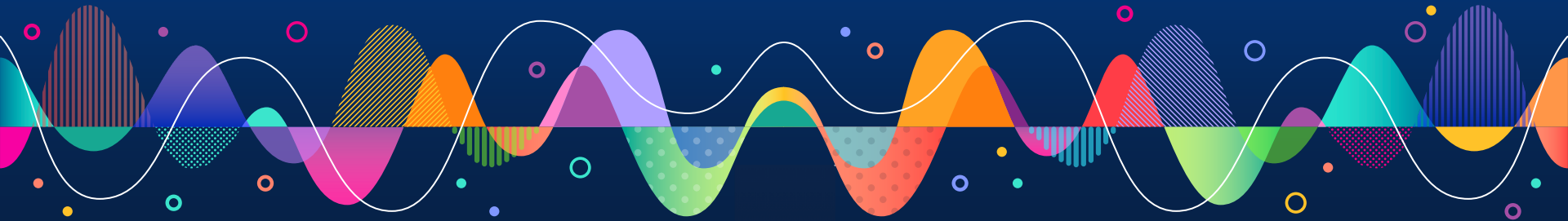
INSIGHT

Not being able to detect the presence of others makes it hard to engage socially and build rapport.

NEED

It would be game-changing to provide a fast and easy way to detect the presence and identity of others in the same vicinity without having to visually see them.

Inferences and Questions

▹ What proportion of visually impaired individuals don't find voice assistance in technology helpful? Why?

▹ Taking into consideration that everyone with visual impairments has different accommodations and preferences as to what is helpful to them, how do we design in a way that provides more accessibility rather than constraints?

▹ It's possible that devices that are set up and designed in such a highly specialized way are overdone and not as helpful as commonly perceived.

Summary

▷ Magnification and color schemes are powerful tools

▷ It's important for devices to be flexible and allow users to be different distances from the screen.

▷ Every visually-impaired person has different technological preferences about what works for them

▷ Increasing the accessibility of technology that already exists could help with social connection and inclusion, instead of only designing tech specifically for the visually impaired