When Visual Communication Intervenes in the Accessibility of Birdwatching

Reason

For many birdwatchers, **hearing** is actually more important than seeing when it comes to identifying birds.

Some birders do up to **70%** of identifications by ear.

Deaf birdwatchers use **visual observation**, **environmental signs** and **assistive technology** to help them spot and identify birds.

How d/Deaf Birdwatchers Adapt

Relying on keen **visual observation** and **environmental cues**

Learning from **movement patterns**, **habitats**, and **flock behavior**

Using assistive technology like **spectrograms** and **bird song visualization apps**

How can we make these things more **accessible** and **enjoyable** for d/Deaf people?

Our Approach

Exploring different ways to make birdwatching more accessible:

Finding birds – Mapping active areas

Navigating to Birds - Guiding Bird Location

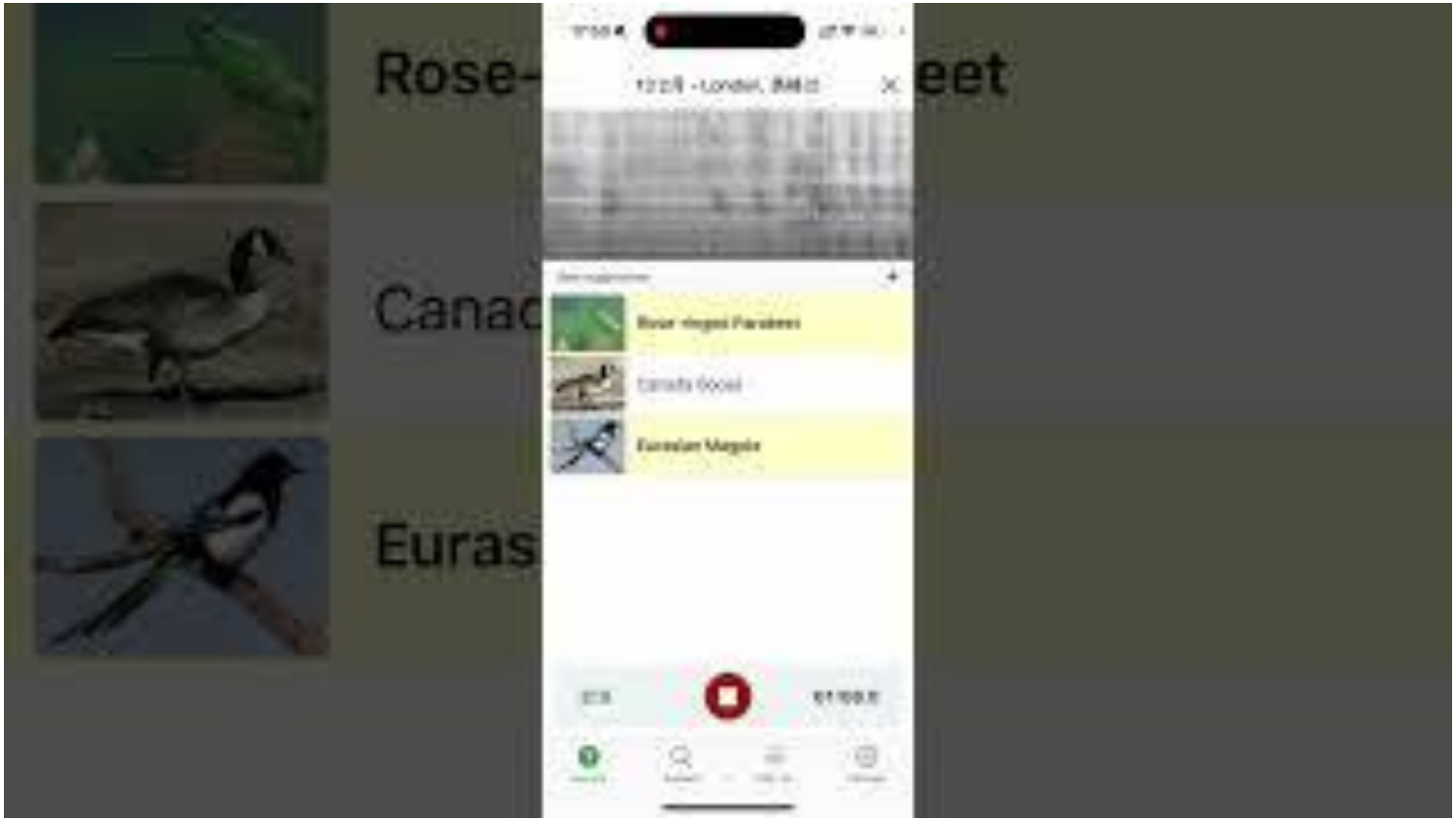
Experiencing bird songs – Visualizing sound

Communicating – Using sign language for birding

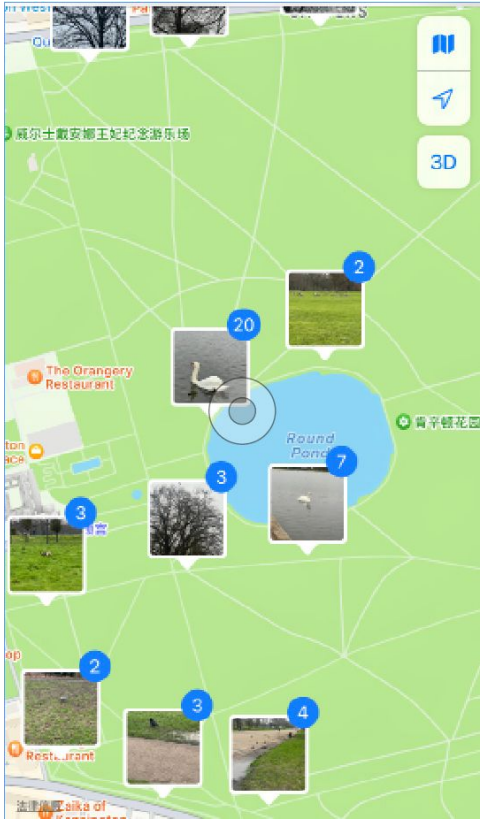
Research

Birdability is a nonprofit organization dedicated to making birding and the **outdoors accessible** and **inclusive for everyone**, especially those with disabilities and other health concerns. Their mission encompasses education, outreach, and advocacy to ensure that the birding community and natural spaces are welcoming, safe, and accessible for all.

Merlin Bird ID



Map & Research

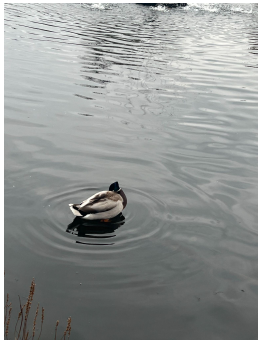


Birds Species



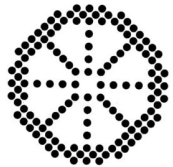






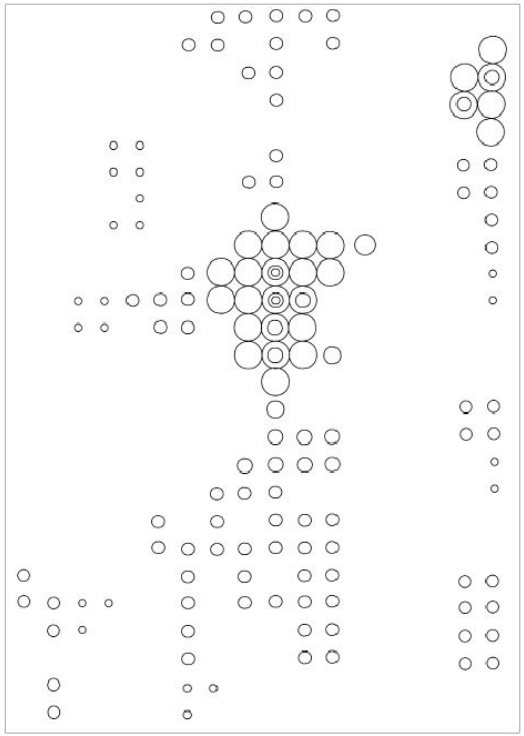
Research

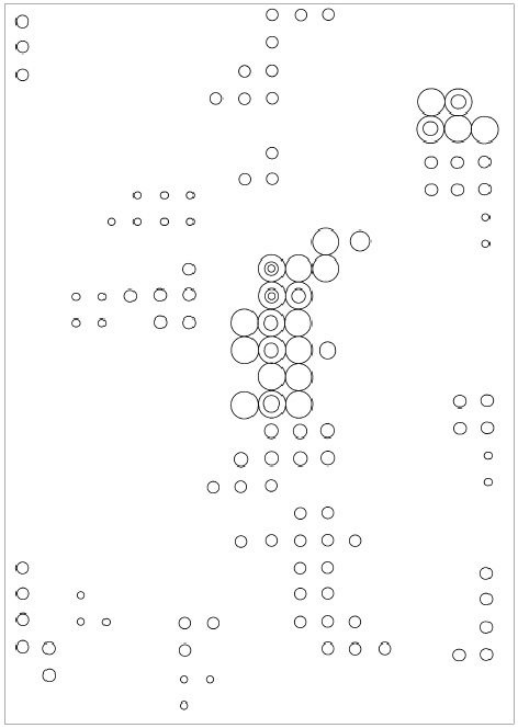


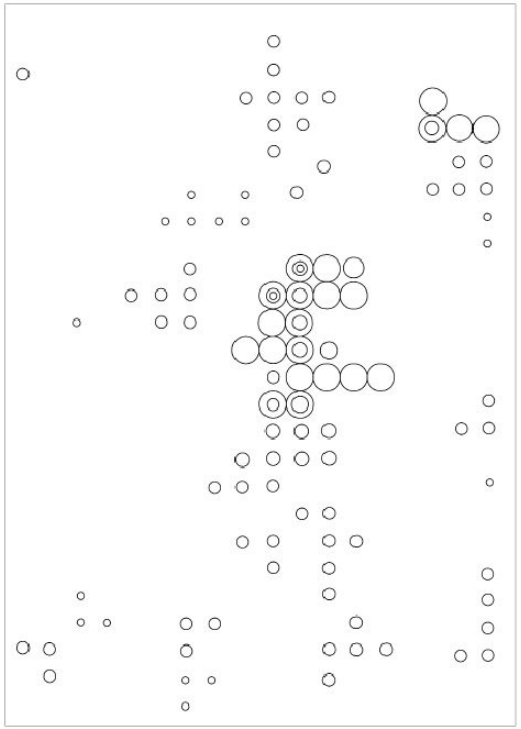
Open Ai advertisement

Reference：
https://www.xiaohongshu.com/discovery/item/67aca6ee000000001800a9b5?source=webshare&xhsshare=pc_web&xsec_token=ABwZ-HCfvamLtZG-iyNJ_PdG2KKFvRfJ9eyhneot5V1x0=&xsec_source=pc_share

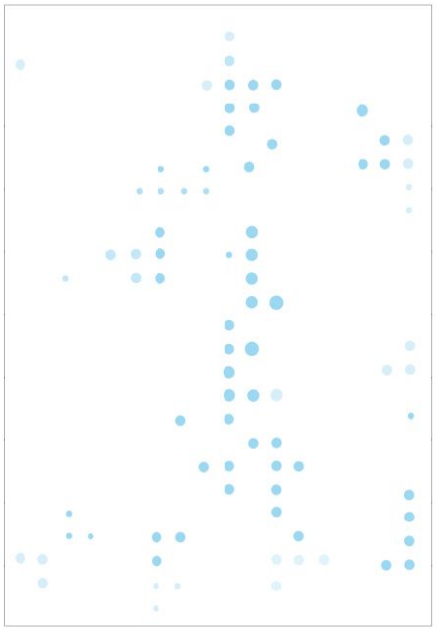
Birds Distribution（Quantity）

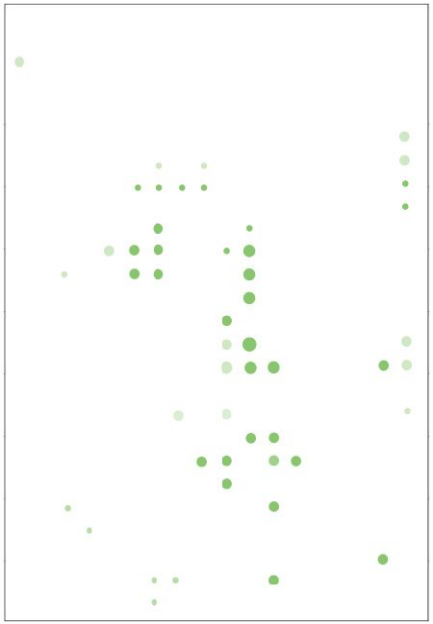


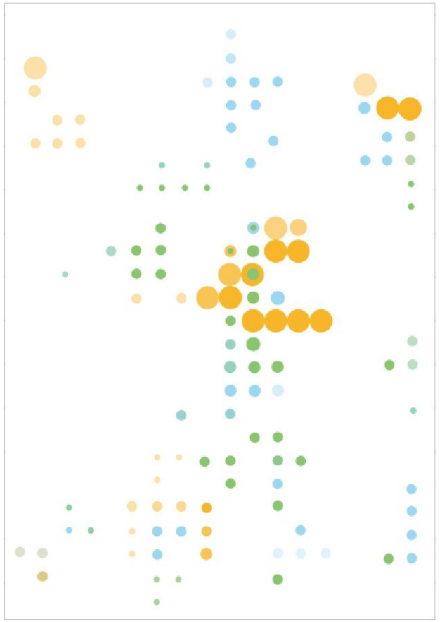




Birds Distribution (Species)

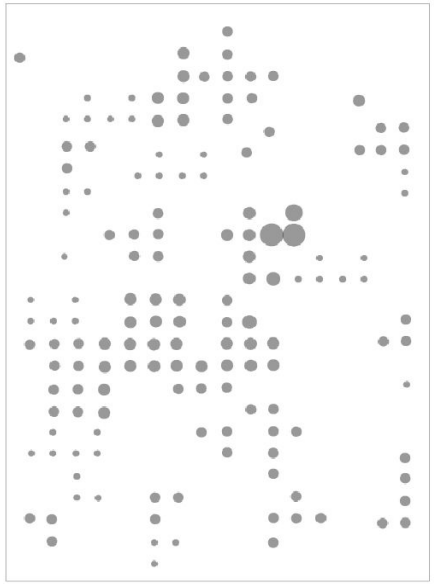
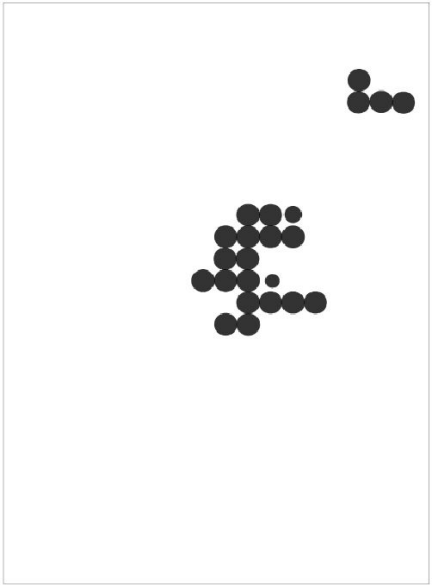
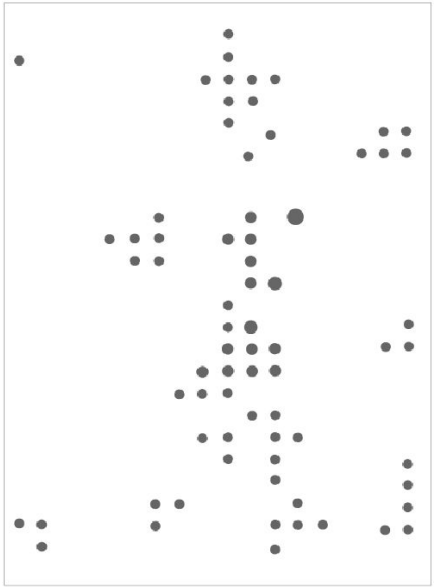
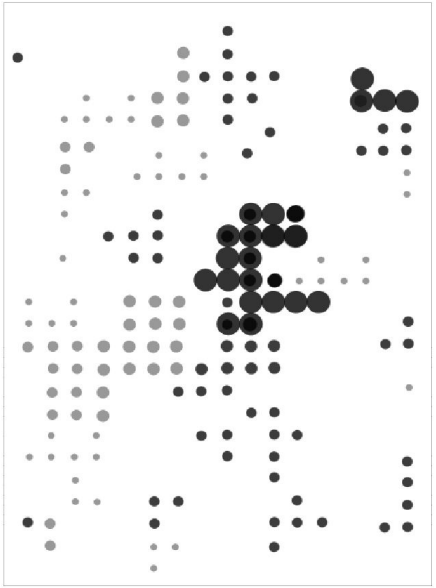


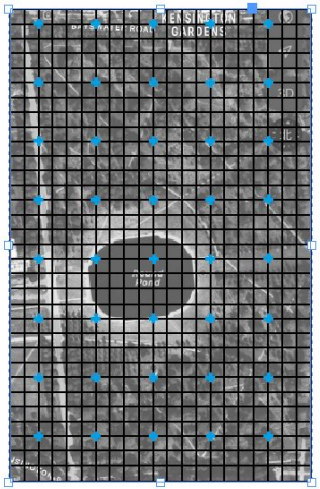


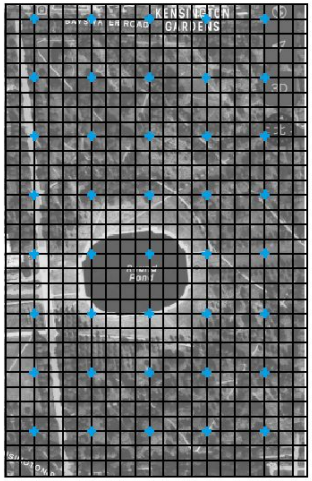


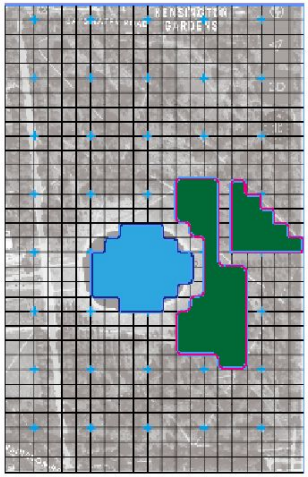
birds varies

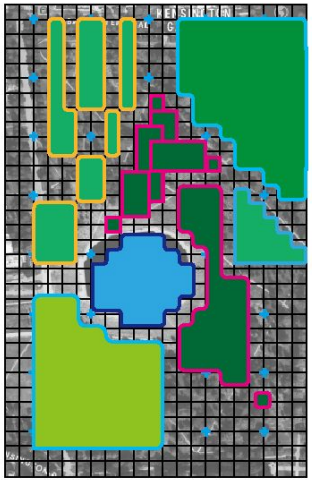
Birds Distribution（Behavior）

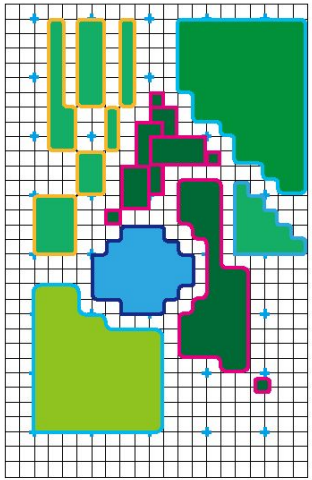





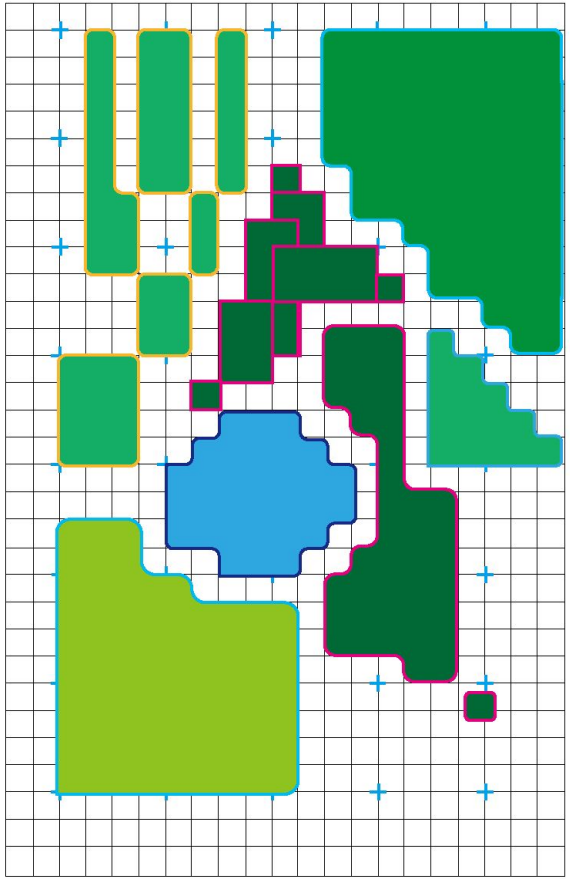


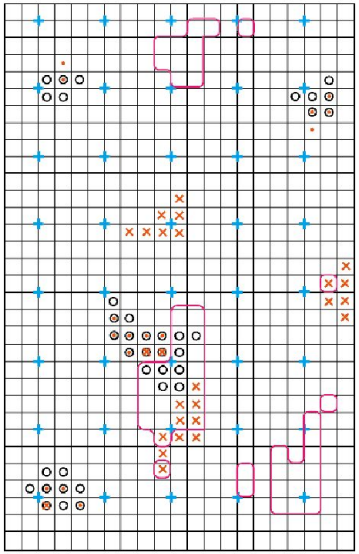


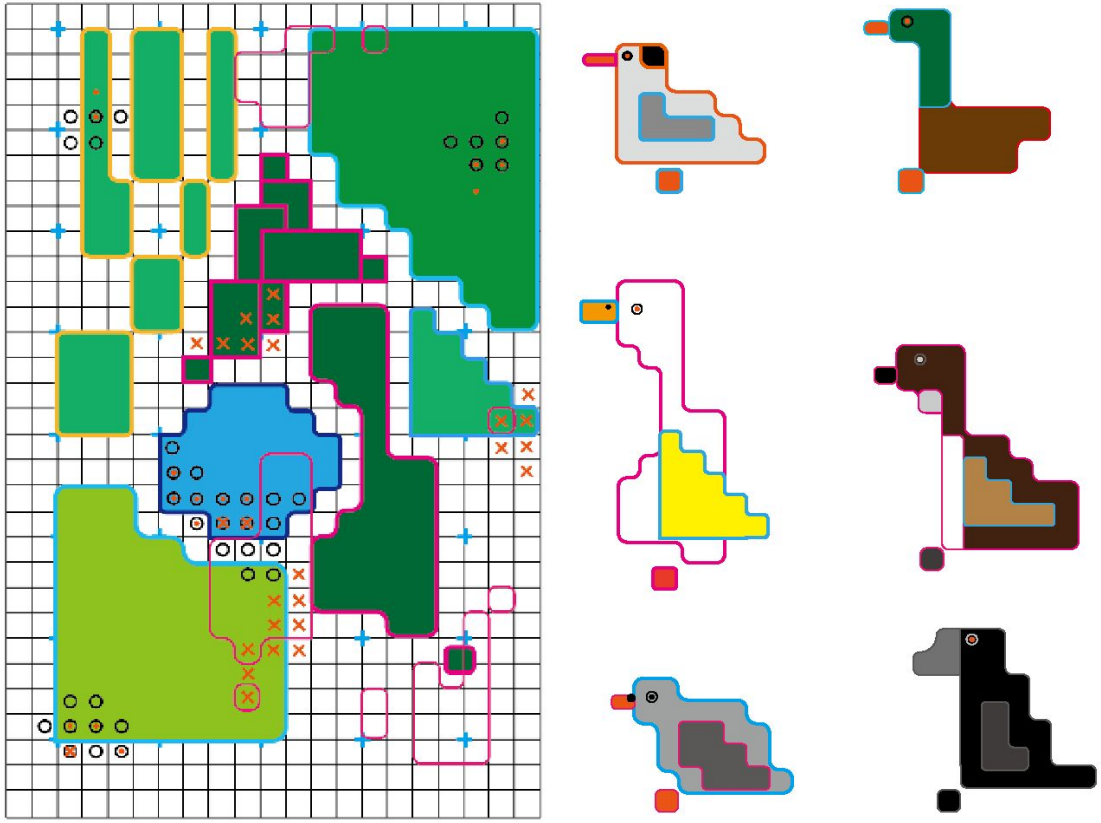


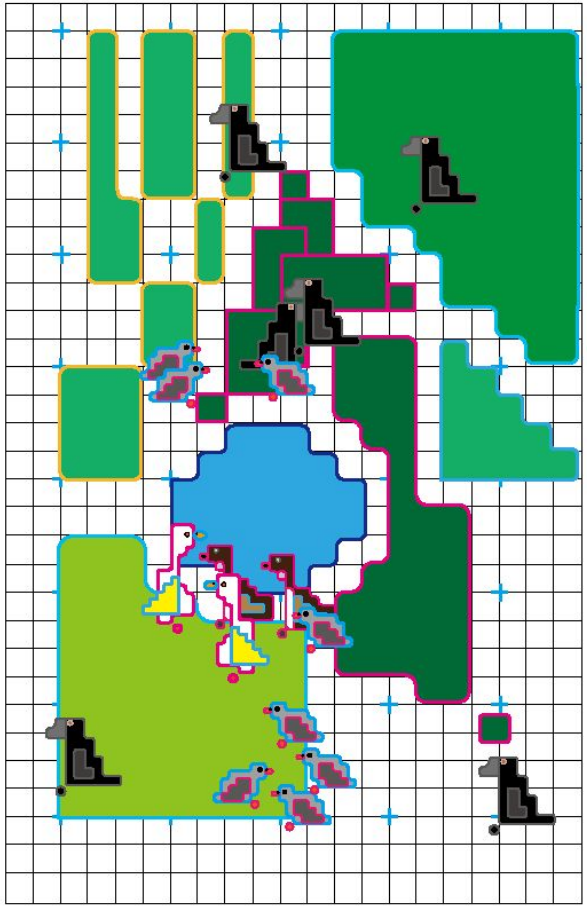


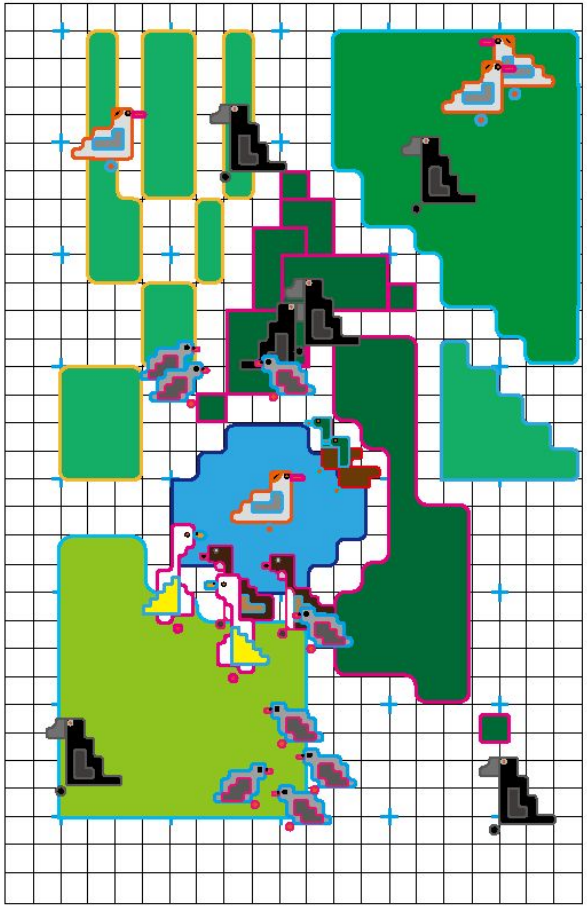












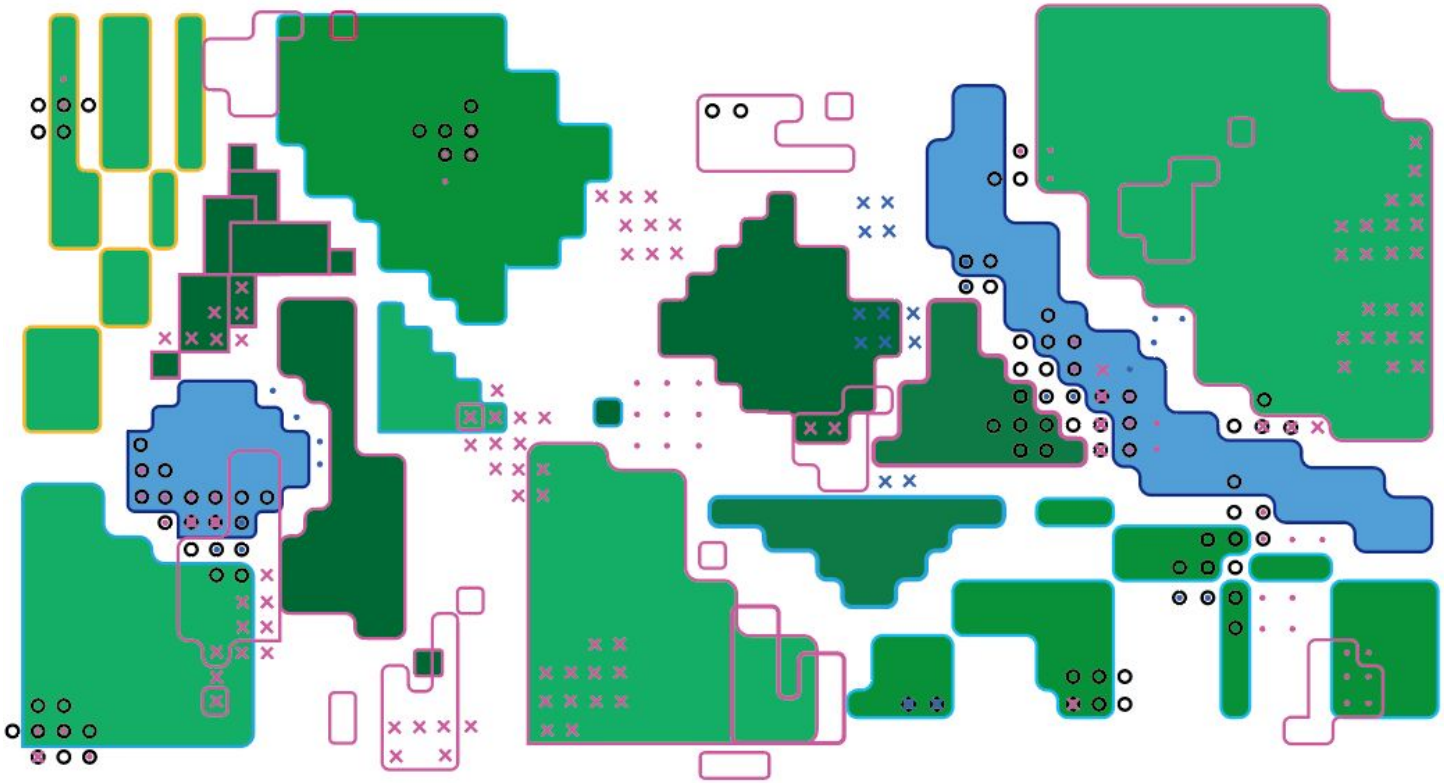


Figure Legends

Pain points

1. **Difficulty in Locating Birds** – Deaf birders rely only on **visual scanning**, making it **slower and harder** to find birds compared to hearing birders who detect them by sound first.

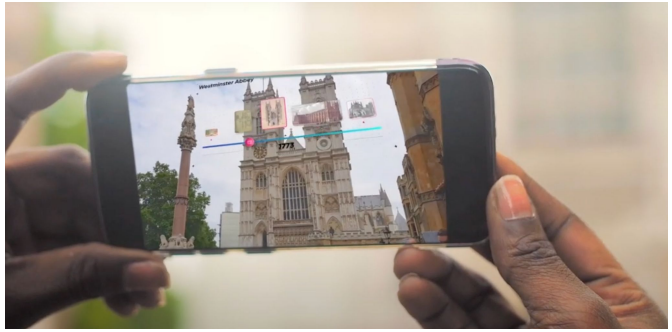
2. **No Directional Clues** – Without sound, deaf birders **can't judge distance or direction**, leading to **more time spent searching in the wrong places**.

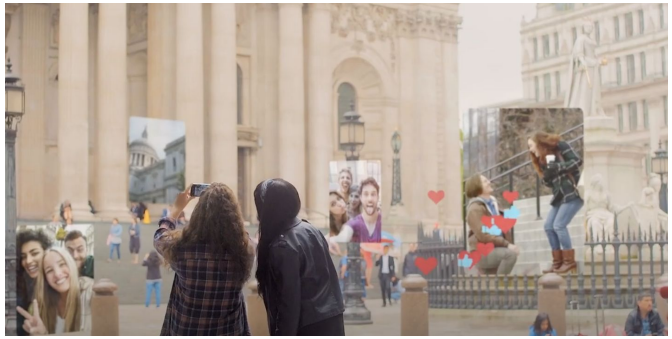
3. **Missing Hidden Birds** – In dense areas, hearing birders **wait for bird calls** to locate hidden birds, while deaf birders **may miss them completely** because they don't know where to focus.

AX Visio

This is an **AI-powered smart binocular** that combines exceptional optical quality with advanced digital features. Utilizing computer vision and geolocation technology, the AX Visio can **identify over 9,000 bird species** in real-time, providing users with **immediate species recognition** and **location information**.

ScapeKit



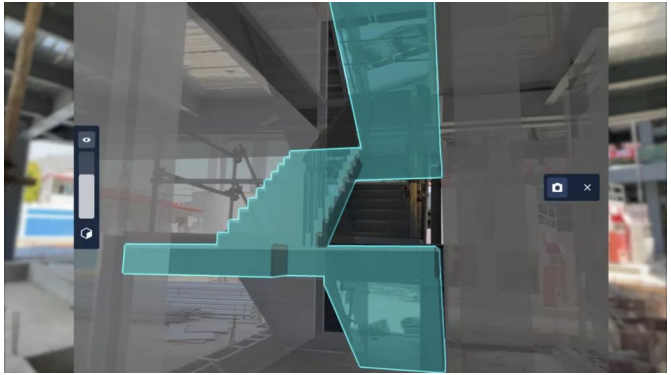


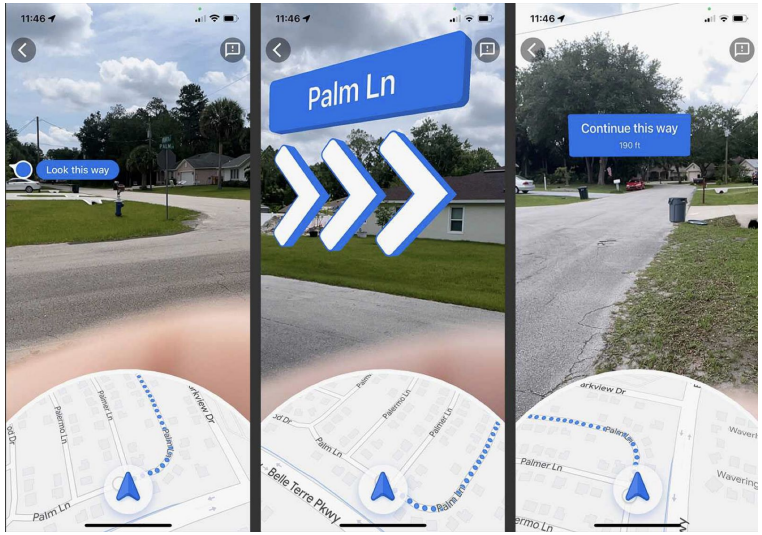
ScapeKit is an **AR tool** that helps place virtual objects **accurately in the real world**. It **tracks locations in real-time** and adjusts based on the environment.

Real-time AR tracking to accurately place virtual objects → Inspired me to create **floating AR markers** that change size, brightness.

Adapts AR visuals to match real-world obstacles like trees → Inspired me to use **pulsing effects or directional AR arrows** to guide d/Deaf users to birds.

Visual Reference-AR Guidence





Critical Thinking

How Can We Best Represent Bird Locations Visually?

- Should we use **AR directional arrows, bounding boxes, or glowing indicators**?
- How do we ensure **users immediately recognize** the visual cues?

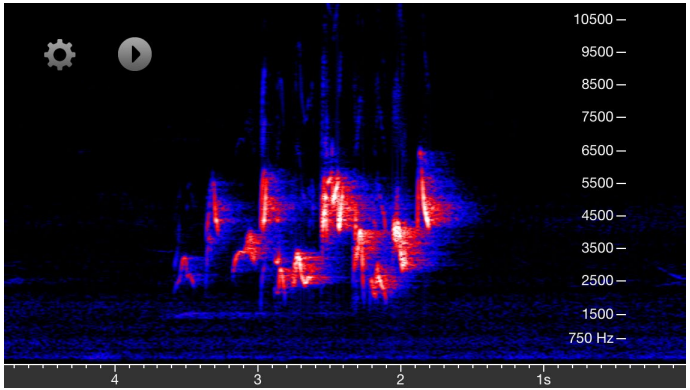
How Can We Adapt to Different Viewing Conditions?

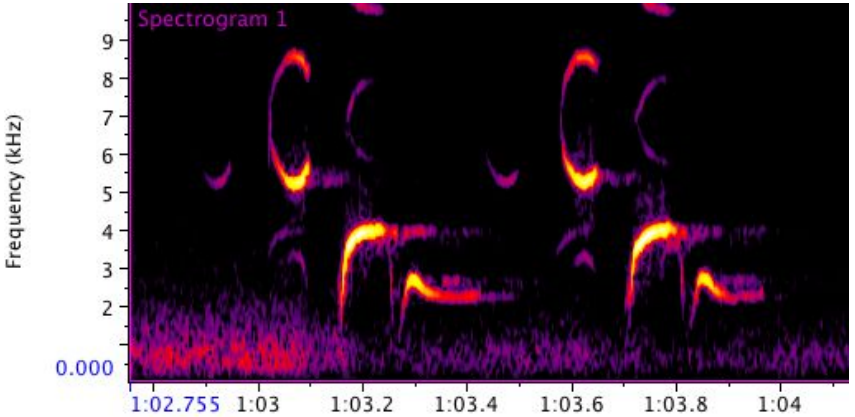
- How can we ensure the **visual indicators remain visible in different lighting conditions** (e.g., bright sun, dense forests)?

How Can We Visually Convey Joyful Experiences?

- Use **warm, vibrant colors** to create a relaxing and uplifting interface.

Bird Song as a Joyful Experience





Seeing Song: an Interview with a Partially Deaf Ornithologist who Studies Bird Song

This research explores how bird songs can be visually represented through pattern graphs that imitate sound waveforms, allowing d/Deaf individuals to experience bird songs in a **joyful** and immersive way.By translating rhythm, pitch, and tone into abstract patterns, this approach aims to provide an alternative way to "hear" birds visually.

While assistive technology such as spectrograms exists, current solutions are often focused on **identification rather than enjoyment**.

Tough Little Birds. (2015). *Seeing Song: An Interview with a Partially Deaf Ornithologist Who Studies Bird Song.* Retrieved from https://toughlittlebirds.com/2015/01/26/seeing-song-an-interview-with-a-partially-deaf-ornithologist-who-studies-bird-song/

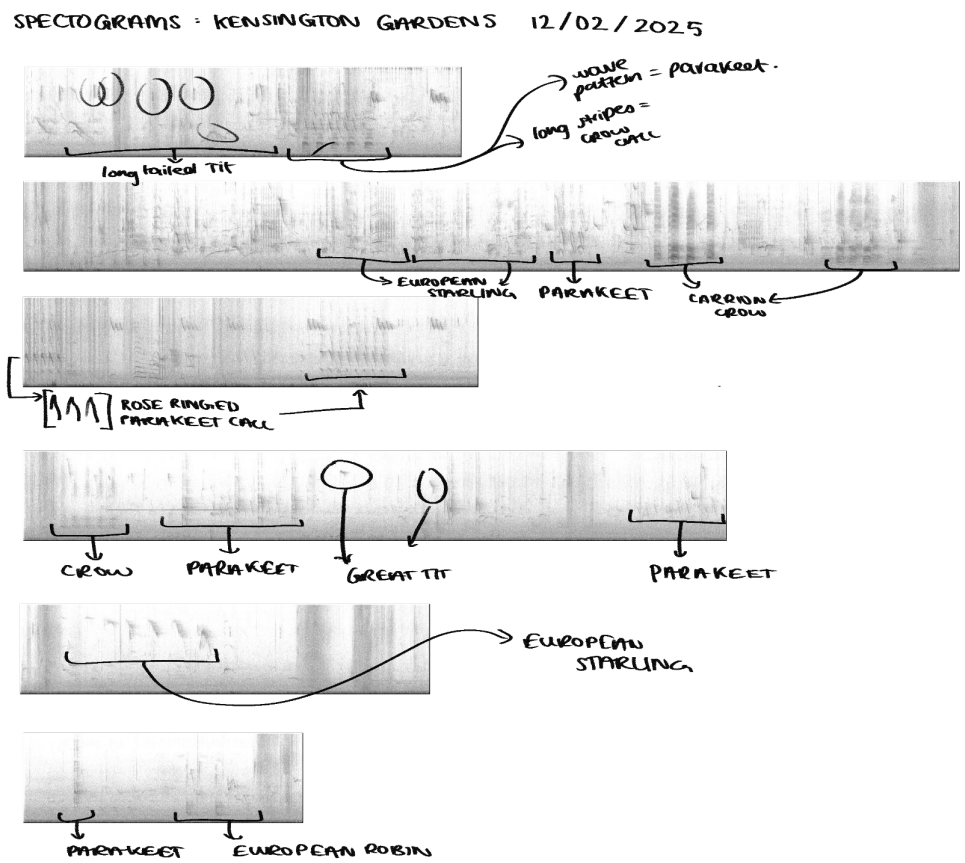
The Role of Sound in Birdwatching

Sound does play a large role in finding birds, but what about the **joyful experience** of hearing bird sounds?

There are apps such as Merlin ID which enable d/deaf bird watchers to identify birds through spectrograms and sounds, however many birdwatchers experience **joy** through bird songs - d/deaf birdwatchers don't have access to this part of the experience so:

How can we visually translate these sounds to share this joyful experience?

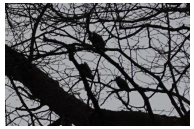
Exploration



Great Tit

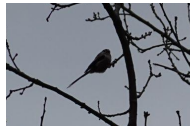
Ringed Neck Parakeet

Carrion Crow



European Starling

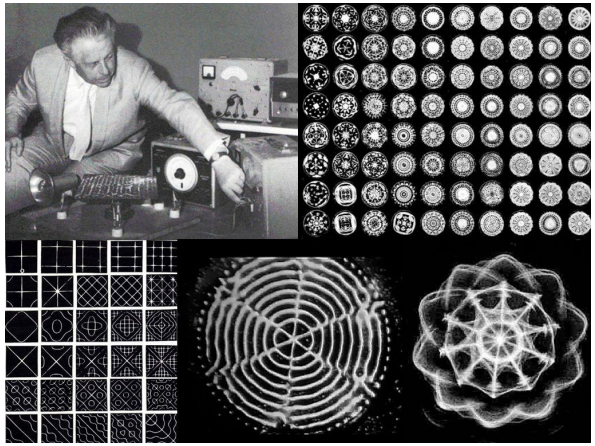
Long Tailed Tit



For my exploration, I visited the park and used the Merlin ID app to listen to and identify bird calls. After identifying a bird, I would locate it and photograph it. This process allowed me to immerse myself in the experience and better understand the challenges faced by d/Deaf birdwatchers, aiming to gain insight into their perspective and how they engage with birdwatching without relying on sound.

After exporting the spectrograms, I began to identify the different patterns which resembled the calls or songs of different birds.

Research



Dr. Hans Jenny's cymatics experiments revealed how sound creates intricate patterns when interacting with mediums like sand or liquids. This concept could be applied to birds: by translating bird songs into organic, patterns. Using dynamic, flowing patterns, similar to cymatics, could make the visual representation of bird calls more immersive and emotionally engaging for d/Deaf birdwatchers rather than spectograms.

The idea of visualizing sound has been explored in music design, such as in Jay Vaz's *Dreaming Vinyl* project, which translates music into animated visual forms, enhancing how sound is experienced beyond hearing (Vaz, 2022). This approach of visually interpreting sound can be applied to bird songs: by creating patterns based on the different 'shapes' of bird calls (as I explored through the spectograms) - the sounds of different bird breeds could create a beautiful collection of patterns which could be both informative and beautiful.

Cymatics high-speed camera photography tutorial - Photo Cherry (2019) *Cherry Harrison Photography*. Available at: https://photocherry.co.uk/cymatics-photography-tutorial/.

Vaz, J. (2022). *Graphic designer Jay Vaz on designing for music and visualising the sounds he loves.* Creative Lives in Progress. Retrieved from https://creativelivesinprogress.com/articles/jay-vaz

Critical Thinking

Many existing sound visualizations take on a **technical, data-driven aesthetic**.

- Is there a way to help retain a connection to the bird itself rather than reducing it to abstract data?
- How can I bring back the organic, natural essence of birds and their environment through these representations?
- Should these visualizations serve as static representations or interactive experiences? Could movement or interactivity help convey the rhythmic nature of a birdsong more effectively?
- How do I balance the need for clear, accessible information with the desire for a more poetic representation? Would simplifying the patterns lose their connection to the bird, or would it make them more engaging?
- Could I integrate other sensory elements to complement the visualizations and create a more immersive way for d/Deaf people to "feel" birdsongs?

Birdsongs are often associated with certain emotions (calm, alertness, nostalgia).

- Is there a way to translate these subjective experiences into a **visual language that resonates with d/Deaf viewers**?
- Can a visual pattern truly evoke the same emotional response as hearing a bird song? Are there visual elements (movement, color shifts, layering, softness, or rhythm) that can mimic the way bird calls feel to hearing people?

Communicating

Forage

Enter the Water

Spread Wings

Tidy up Feathers






Dive

Fight

Splash the Water

Wag Tails

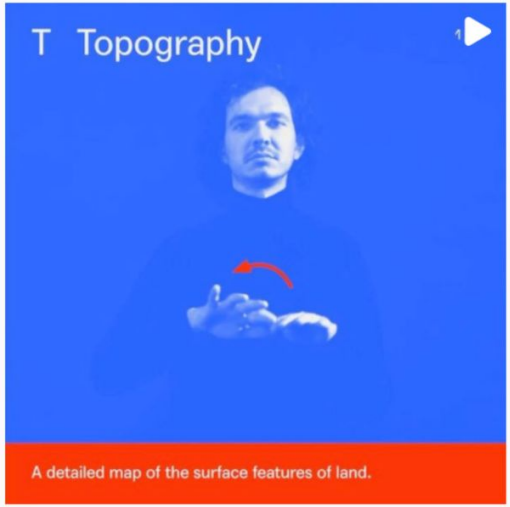
Go Ashore

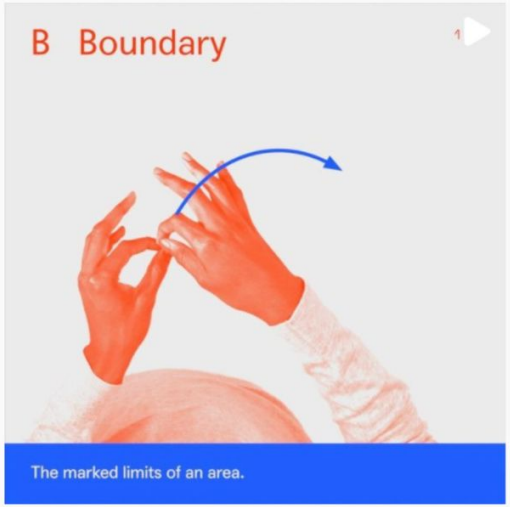
Fly

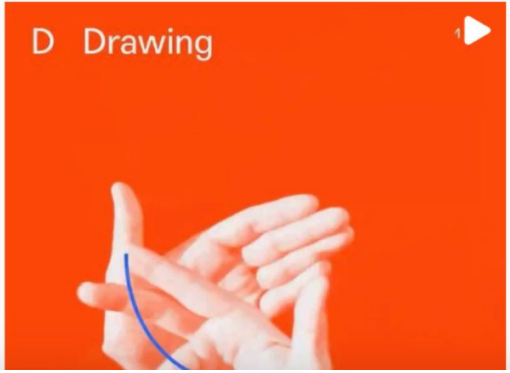
Land

Walk Gloommily

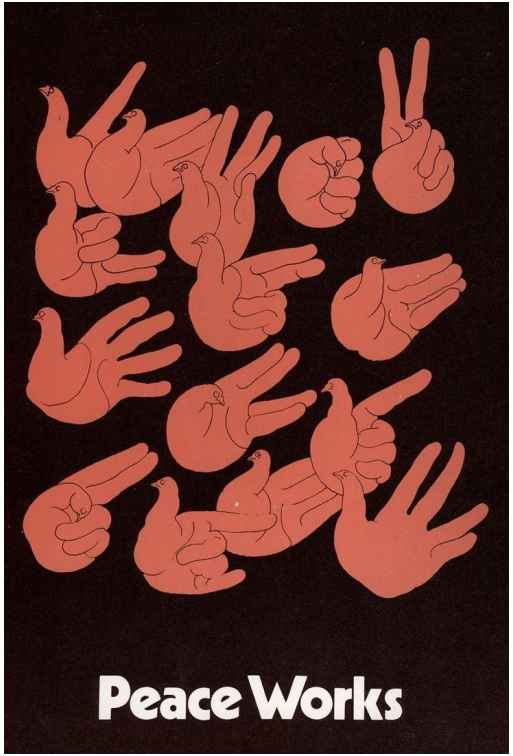
Reference: Signstrokes

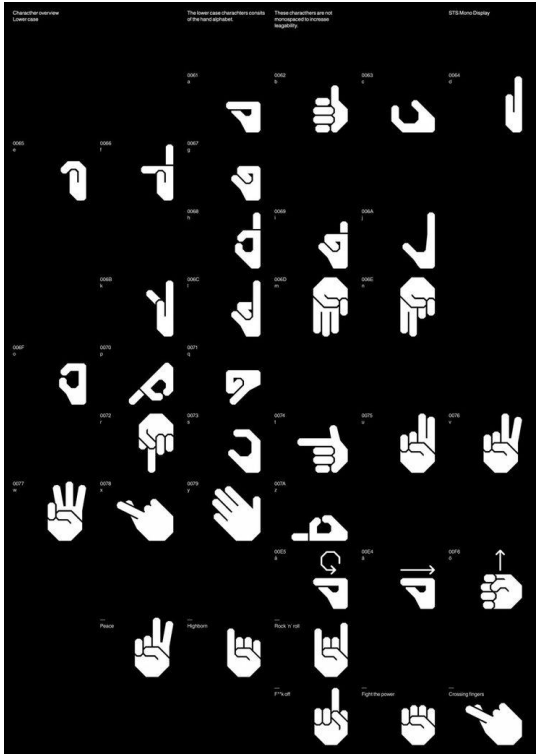






Direction





1. Expanding & Refining Our Concepts

- Develop more iterations of each of our individual explorations, testing various mediums and techniques

2. Bringing Our Ideas Together

- Consider how our individual explorations can be **integrated into a cohesive experience** - could be an app/publication/experience
- Explore interactive elements that could enhance accessibility and engagement

3. Gathering Feedback & Refinement

- Share our iterations within the group and critically assess what works best
- If possible, gather external feedback from d/Deaf individuals or those with experience in accessibility.
- Use insights from feedback to refine and finalize our concepts