A COMPARATIVE OF DOG PERSPECTIVES ON CALTON HILL DOCUMENTATION

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Purpose of A Comparative of Dog Perspectives on Calton Hill

In this experience, you will step into the perspective of various dogs and explore how different-sized breeds perceive the world around them. We have chosen three distinct breeds: Chihuahua, Irish Wolfhound, and Labrador.

Idea

For our initial demonstration, we have selected two dog breeds that exemplify remarkable size differences: the Chihuahua and the Irish Wolfhound. By alternating between their perspectives, we aim to explore the distinct auditory and visual experiences each breed encounters in their everyday lives. The Chihuahua, with its petite frame, perceives the world from a lower vantage point, making sounds sharper and closer, while the Irish Wolfhound, towering in stature, perceives a broader environment, allowing it to detect distant sounds and sights that might go unnoticed by smaller dogs. This comparison will shed light on how these differences in size impact their interactions with various stimuli and how they navigate their surroundings, enhancing our understanding of their unique sensory experiences.

Picking up the Location

Initially, we planned to carry out the project across the Royal Botanic Garden, Calton Hill, and the National Museum. But after some reflection—and a wise suggestion from Jules—we thought it best to narrow it down to Calton Hill. It already offers everything we need: nature, human beings, natural sounds, human sounds… all in one poetic spot. Plus, there is something far more meaningful in creating one specific thing that is both specifically focused and specifically intricate.

Production Process

The entire production process has been categorised into several stages: sourcing and purchasing the necessary materials; crafting the binaural dog heads in sizes representing Chihuahuas, Labradors, and Irish Wolfhounds; collecting ambient sounds (considering that dogs of different heights perceive sonic information differently); filming footage that represents what dogs might see and perceive; recording both the sounds dogs produce and those they might hear; editing and mixing audio and video; designing, decorating, and testing the presentation set with visuals and props; and finally, presenting the work and refining the sound pieces based on feedback from the presentation.

1. *Sourcing and purchasing the necessary materials*

Materials list:

- Dog chewer (For immersive decoration)

- Dog treat ball (why we choose the blue one—blue and yellow are the colours that dogs see most clearly.)

- Numerous (lose count) plasticine
- PVA glue
- Brush (For applying the PVA glue on the plasticine)

2. *Crafting the binaural dog heads in sizes representing Chihuahuas, Labradors, and Irish Wolfhounds*

- Dog Head Sizes and Breed Categories

Based on the three types of dogs featured in our project, we created head models of different sizes:

- Chihuahua (small breed): The actual head diameter is about 6–8 cm. We chose 8 cm as our reference.
- Labrador Retriever (medium breed): Scaled up to a 20 cm head diameter.
- Irish Wolfhound (large breed): For the greatest contrast, we made the head about 35 cm in diameter.

By creating models with these size differences, we aim to simulate how dogs of different breeds and sizes might experience sound spatially. This gives us a physical foundation for our sound design.

- Materials and Construction Approach

We used three main materials to build the dog heads:

- Cardboard: Served as the skeletal framework—lightweight, easy to cut and shape, yet strong enough for structure.
- Plasticine: Simulated the "muscle layer" and soft tissue of a dog's head, giving weight and flexibility to the shape.
- White glue (PVA): Brushed on the outside as a sealing layer to strengthen the structure, prevent deformation, and add texture.

An unexpected bonus of this combination is the tactile and acoustic feedback—when you tap the completed dog head, it produces a sound somewhere between soft flesh and solid form, very similar to striking actual animal tissue. This

quality gave us ideas for using these models not only for microphone placement but potentially as physical sound sources for future sampling.

- Challenges and Solutions During Construction

During the process, we ran into a shortage of cardboard. To make the most of what we had, we carefully selected the best pieces and **patched them together using transparent tape** to form the frame.

Initially, we were concerned about whether the taped structure would hold, but once the clay was added over it, the overall form became much more solid and stable, more than we expected.

In terms of practical functionality, we also designed the heads with recording in mind. We left microphone slots on both sides of the head, aligning roughly with where a dog's ears would be, and created openings at the bottom and side for cable routing. This setup allows us to mount mics easily and connect them to recording devices, achieving a binaural recording experience that closely mimics a dog's hearing position.

Despite the simplicity of the materials, this handmade process gave us valuable insights into structural design, texture, and acoustic response. It also laid a solid foundation for the next phase of our work—testing how the different-sized dog heads affect recorded sound in the same environment and further exploring the relationship between body structure and auditory space.

3. *Filming footage that represents what dogs might see and perceive*

We chose to shoot in the afternoon because the lighting at that time is softer and more vibrant. The scenery at Calton Hill during this time also fits well with the atmosphere we wanted to convey.

- Scene One: “Distraction by Choice”
  In the first scene, we set up a playful moment where a dog is chasing a ball but suddenly gets distracted by another toy. To enhance the audience’s sense of immersion, we decided to film the ball-throwing and the dog’s gaze following the ball as video, while the rest of the sequence would be presented through photographs. We believe that photos give more space for the sound design to come forward, allowing audio to take the lead in crafting an immersive experience。

- Scene Two: “A Quiet Moment”

  In the second scene, the dog looks around before quietly lying down in front of its favourite toy. The movement is subtle but emotionally more contained. Here, too, we chose to film the moment of the dog lying down to strengthen the feeling of presence while using photographs to complement the setting and visual composition.

- Shooting Method & Lens Choices
  We started with the "big dog vs. small dog" group. To ensure visual consistency in composition, we kept the camera position fixed and adjusted the height of each dog model so that both appeared to be at the same eye level. This allowed for a clearer comparison of their sizes and perspectives.

We also made specific choices regarding lens focal lengths to simulate the field of view from each dog’s perspective:

- The Chihuahua was shot with a 24 mm lens, which offers a narrower field of view to match its small size.
- The Irish Wolfhound was captured using a 14 mm wide-angle lens, highlighting the broader perspective granted by its larger body.
- The Labrador Retriever, as the mid-sized reference, was shot with a 19mm lens, striking a balance between the two and representing a “medium perspective”.

With such a setup, we hope the audience can not only observe the dog’s behaviour but also visually experience how dogs of different sizes perceive the world differently.

4. *Recording both the sounds dogs produce and those they might hear*

- *Sound Effects*

Our main recording equipment was a pair of AKG C414 XLS microphones, chosen for their excellent sensitivity and clarity, perfect for capturing the subtle environmental sounds we need for this simulation project. To make the recordings feel as close as possible to a dog’s hearing experience, we tried to replicate the physical characteristics of a dog’s head and ear position as accurately as possible.

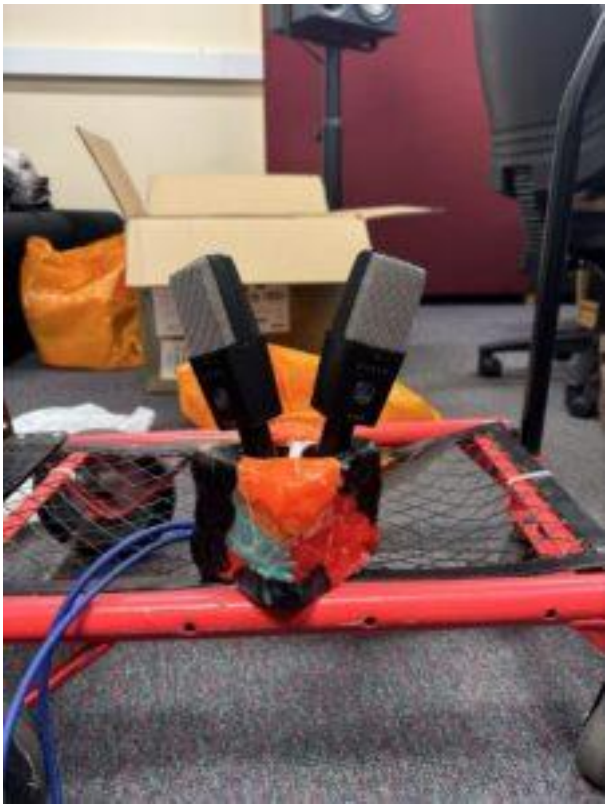
One challenge we faced was with the Chihuahua model. It’s such a small dog with a very low shoulder height, and we couldn’t find a regular mic stand that worked at that level. In the end, we placed the Chihuahua model on a flat trolley, which turned out to be the perfect height, around 15 cm, very close to a real Chihuahua’s ear position.

Another issue was that the dog heads couldn't be mounted directly onto a mic stand. So, we borrowed a speaker stand tray from the music store and used it to

support the dog head models. This worked well, keeping everything stable and secure during the recording.

We recorded at different heights according to the breeds:

- Chihuahua: about 15 cm
- Labrador: about 60 cm
- Irish Wolfhound: about 120 cm



These heights correspond roughly to each dog’s natural ear position when standing, helping us better simulate spatial hearing differences between breeds.

One problem with the studio environment was the flooring. Our video scenes are set on grass, but the studio had a carpeted floor. To recreate the sound of footsteps on grass, we improvised: we layered a sheet of hard plastic underneath a sheet of soft plastic, then placed both under the carpet. The result was surprisingly convincing—when stepped on, the layered surface produced a sound quite similar to walking on grass.

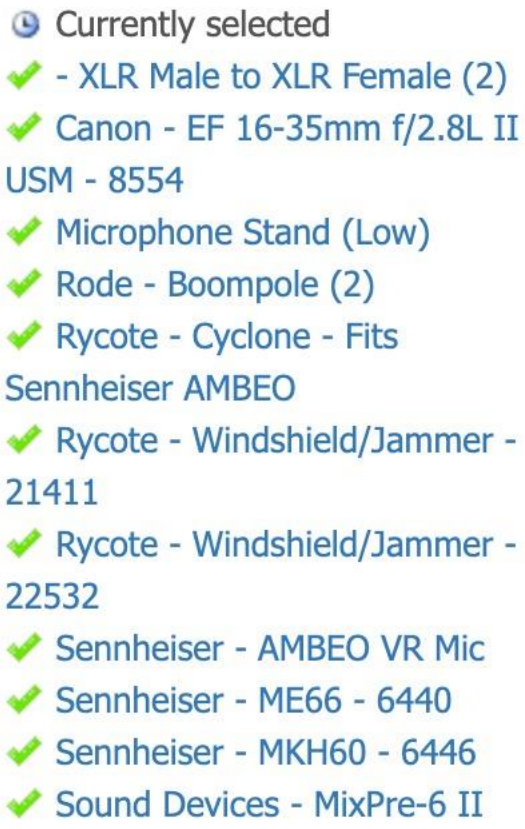
As for sound content, we followed the details from our storyboard and recorded specific elements, including:
- Human footsteps (to simulate off-screen presence)
- Dog footsteps (running, turning, stepping on grass)
- Dog tag jingling sounds
- Toy ball rolling sounds
- Toy ball being squeezed or bitten

Originally, we had also hoped to record background crowd noise and bird sounds to enrich the ambient layers. However, since the dog head models are fragile and not very portable, we decided to skip outdoor recording for now.

All in all, the recording session was productive. Despite some limitations in space and materials, we managed to recreate the environment and capture the sounds we needed. Once the recordings are sorted, we'll move on to editing and mixing. I can't wait to hear how the world sounds from inside a dog's head!

- *Ambience*

Equipment：



We recorded environmental sounds using the Sennheiser AMBEO VR microphone. And we captured three separate recordings at the same location, with the only difference being the recording height, to simulate how dogs of different sizes perceive their surroundings.

Since the Chihuahua is very small, we couldn't find a mic stand low enough to match its ear level. So, we rested the microphone directly on the mic stand at a low angle to approximate its actual height.
For the Labrador and the Irish Wolfhound, we recorded at approximately 60 cm and 120 cm from the ground, respectively, to match their standing ear positions.

5. Editing and mixing audio and video

Ruiqi:

As we have recorded the background sounds according to different kinds of dogs' sizes and hearing traits, coupled with sound effects that they would hear or make, we presented them in the mixing as much as possible.

For the blind Labrador part, I went with binaural audio — so the sound feels like it’s happening all around your head, helping listeners feel a bit more “dog” in the process.

Reaper Project of Deaf/ Blind Dog

For dogs who have issues with watching, an orange speaker was added to its soundtrack to boost the sensation of acuity and sensitivity.

Adding up the high frequency and granularity

And other details about processing are listed below for reference.

Amping up the distorted vibe

Complying with the dog's hearing range, 40- 60 kHz

The deaf dog version is processed based on the blind dog's configuration (but not binaural anymore, because it can only hear things on one side, as discussed). However, I've panned the previous soundtrack to the left channel, while adding a pure sine sweep, two octaves above, into the right, amplifying the sensation of distraction and disorientation. (I suspect those dogs can't perceive orientation at all.)

Zixuan:

In the "large dog vs small dog" section of the video, since the camera perspective switches back and forth between the two dogs, I applied a similar approach in the sound design. Specifically, I alternated between the two pre-recorded and processed environmental ambience tracks, matching the shift in perspective. This allows the audience to clearly perceive the difference in spatial hearing between the two dogs.

Beyond the environmental ambience, my main focus during the sound design process was adjusting all sound elements except for the dogs' own vocalisations, especially the EQ and tonal treatment of sound effects and human speech.

From a dog's perspective, language is not fully comprehensible—what they pick up on are mainly tones, short commands, and key phrases. So, I used AI to generate a segment of human dialogue. I preserved the parts that sounded like clear commands or recognisable short phrases, while processing the rest to obscure the words. The result is a voice that maintains intonation and emotional tone, but becomes unintelligible, simulating how a dog might hear someone speaking without understanding the language.

Additionally, I made a clear distinction between the owner's voice and the voices of other people in the environment. In a dog’s world, the owner’s voice holds unique emotional weight and should sound different from everyone else.

For the owner's voice, I used a combination of Phat FX and Step FX. This blend created a sound that is partially unintelligible yet emotionally expressive, preserving the rhythm and tone without full clarity. It contrasts with the later segments where commands are delivered unprocessed, helping to distinguish the emotional impact of meaningful phrases.

For ambient crowd voices and general human chatter, I applied only Phat FX. This gives the sound a more distorted, less emotionally direct quality, where the language becomes vague and the tone more abstract, creating a sonic contrast to the owner's voice.

Finally, I adjusted the EQ of all non-dog-originated sounds (environment, effects, and speech) based on the dog's size and presumed hearing characteristics:
For larger dogs, I boosted low frequencies and reduced highs, creating a broader, fuller sense of hearing.
For smaller dogs, like Chihuahuas, I enhanced the high frequencies and cut some lows, narrowing the sound field to make it sharper and more focused.

Through all of these audio decisions, my goal was to ensure that the audience not only sees the world through each dog's eyes but also hears the world as each dog might—highlighting how size, focus, and emotional connection shape the canine listening experience.

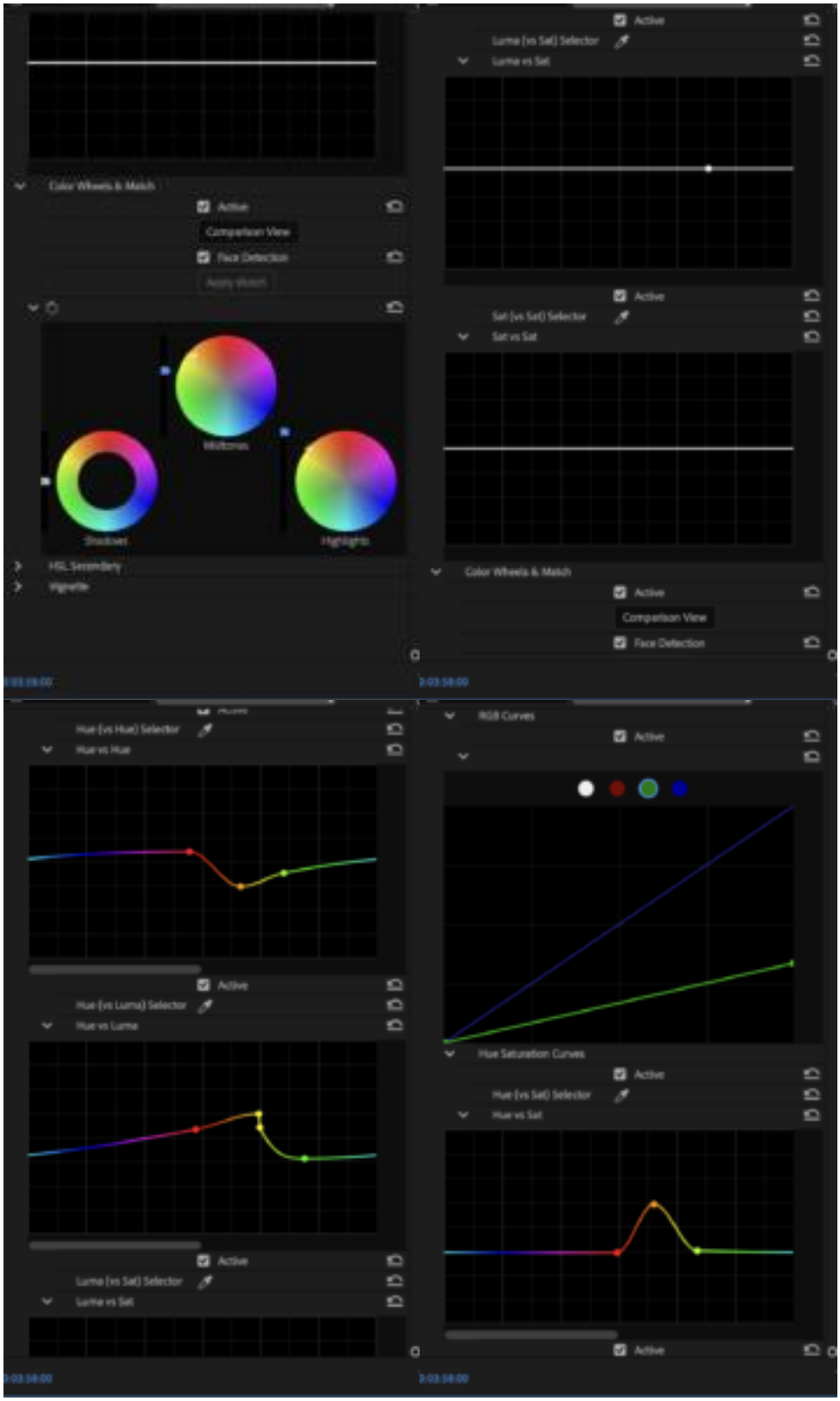
Carly:

Firstly, I ordered the videos and photos so that it would be a sequence of Chihuahua, Irish Wolfhound, Chihuahua, Irish Wolfhound... and another one for just the deaf dog and another for the blind dog.

After many trials, I could say that I mastered the art of creating a deuteranopia effect in Photoshop. Sadly, we decided to add some videos to the mix, which meant switching to Premiere Pro for editing, as Photoshop does not support videos.

The difference between Photoshop and Premiere is that in Photoshop, there is a filter you can use to help with the process of converting a photograph into deuteranopia. Meanwhile, in Premiere Pro, there is none, so I had to create my own.

This meant adjusting the Lumetri colours myself until I could create a yellow and blue scale image; luckily, I found a way to achieve it.



Once I got the colour down, I played with the brightness and darkness of every photo or video to ensure they were as similar as possible, once that was done, I proceeded to work on the blind dog files, I started blurring the image, then added a dark vignete in the centre of the eye to simulate cataracts, after I darkend the image altogether.

In the following images, you can see the change that the images underwent:

After testing the videos with the phone and the VR headset I realized we needed to make some changes as it was a dizzy and nausea inducing experience, for that we took a screenshot of the actual VR headset example experience and used it to scale our own images.

After adjusting the images, the videos were ready to go.

6. *Designing, decorating, and testing the presentation set with visuals and props—then give it a go!*

    1) *Testing*

Zixuan:

We tested how our images and video content perform in a VR environment. Ruiqi and I went to the library and picked up a set of free VR headsets, then began a full round of testing. It was our first time viewing the project content inside VR, and while we ran into a few issues, we also gained some very helpful insights.

We started by testing the video Carly had created. Right away, we noticed a major issue: there was a thick black border surrounding the video in VR, which seriously disrupted the sense of immersion. It felt like we were watching the content through a "window" instead of being inside the scene.

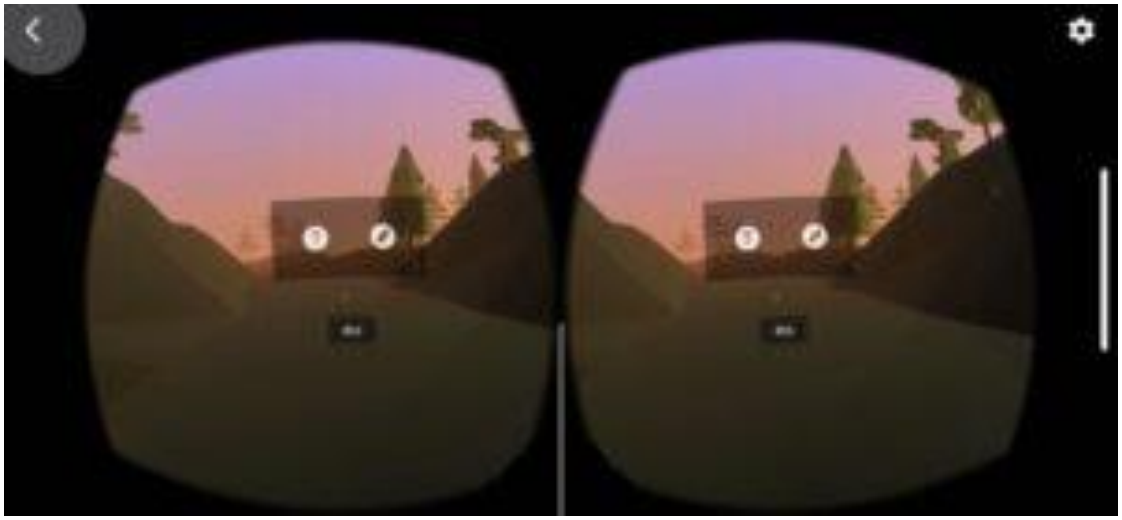
To solve this, we tried enlarging the image to remove the black edges. While this did fill the screen, it introduced a new problem: the content became blurry and hard to focus on, and there was noticeable ghosting and double vision. It made the experience uncomfortable to watch.

So, I decided to open the VR headset's built-in testing app to study what properly formatted images for VR should look like. As expected, there were clear standards for image proportions and layout. I sent one of the reference images to Carly, and together we adjusted our content based on that template. It worked—the focus issue was completely resolved, and the visuals looked much more natural and immersive.

We also tried adding some explanatory text about our project during the black screen sections, but in VR, it was impossible to view the full text properly, so we eventually decided to abandon that idea.

In the final stage, I added a small emotional touch to the video: every time a dog hears a positive word from its owner, I subtly increased the brightness of the screen to represent the dog's happiness and excitement. This gentle lighting shift adds emotional depth without distracting from the experience.

After final testing, everything ran smoothly, and the VR playback now works perfectly. It feels like a huge step forward, and we're excited to let others try it—to finally experience what the world might look and sound like from a dog's point of view!



2) Presentation Procedure:

Experiencers head to the spots near the brink of the hill — not quite falling off, but close enough for a great view of the city and Arthur's Seat.
They plop down on the blanket, put on some cardboard VR headsets, and dive into the world as seen and heard by an Irish Wolfhound and a Chihuahua — one tall, one tiny, both dramatic.
Next, they move a bit closer to the hill's edge — still safe — and can choose to

sit down again or stay standing, depending on how brave or cold they're feeling. Then, it's headset time again, this time to experience the world like a slightly confused Labrador: vision a bit blurry, hearing a bit off (or on), but vibes? We think it is matched.

3) Presentation Materials:

- Binaural dogs' heads: Chihuahua/ Labrador/ Irish wolfhound
- Beyerdynamic Headphones x3
- Adaptor 6.5mm to lightning x2/ Type C x1
- Cardboard VR headsets

- Blanket (For experiencers to sit/ kneel down to fully be engaged in the dogs' perspectives)
- Dog chewer (For immersive decoration)
- Dog treat ball (why we choose the blue one—blue and yellow are the colours that dogs see most clearly.)
- Laminated cue boards

4) **Presentation Purpose**

In this experience, people will see the world through the eyes (and ears) of three very different breeds of dogs. Ever wondered how a tiny Chihuahua, a giant Irish Wolfhound, or a slightly confused Labrador makes sense of things? Well, now's your chance.

5) How Are Human Beings Connected to the Dogs?

Participants video:

https://drive.google.com/file/d/143VWNIUsZ3VPYejHHK57v2QF63xs9eas/view?usp=drive_link

Presentation approach:

https://drive.google.com/file/d/154GcDzNagFkAbWfiMbyCERZPMXh2UfBU/view?usp=drive_link

6) Lovely Moment—Warm Group Photo

7. Presenting the work and refining the sound pieces based on feedback from the presentation

- **When it comes to mixing of ambience**

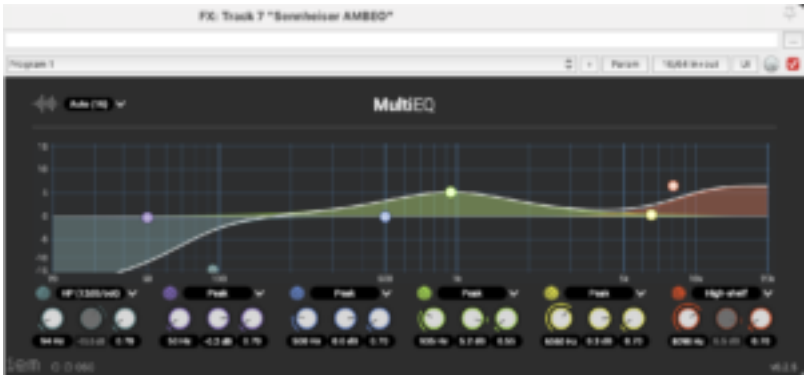
Zixuan:

After recording, I processed the environmental sound recordings for the large dog and small dog perspectives, adjusting based on their body size and likely auditory characteristics.

Larger dogs (such as the Irish Wolfhound) have larger body sizes and ear membrane areas, which make them generally more sensitive to low frequencies and less responsive to high frequencies. So, in post-processing, I boosted the low frequencies and slightly reduced the highs while also widening the stereo image to create a broader, fuller auditory space.

Smaller dogs (like the Chihuahua) are typically more sensitive to high frequencies but less responsive to lows. Therefore, I enhanced the high frequencies, reduced some of the lows, and narrowed the overall sound field to create a more focused, sharper listening perspective.

With these adjustments, we aim to authentically simulate how dogs of different sizes hear the world, enhancing the immersive quality of the experience and reinforcing the concept of "listening from a dog's perspective.


FX: Track 7 "Sennheiser AMBEO"
MultiEQ


MultiEncoder
SN3D
Auto (Int)
FRONT
LEFT
RIGHT
BACK
Encoder settings
IMPORT
Azimuth Elevation Gain
Master
RMS
Azimuth
Elevation
Roll
Peak
Range
Lock Directions
Visualize

Ruiqi:

That was what I did on atmos for Labrador. Dogs typically hear frequencies from 40 Hz to 45,000 Hz, way far exceeding human hearing (20 Hz–20,000 Hz). They are most sensitive to higher frequencies (2k–45 kHz), which are critical for detecting sounds like prey movements, high-pitched whistles and orders. And I think amplifying 4k Hz can make sounds like human footsteps and verbal commands more perceptible.

Initially, I applied a Doppler effect to the sine sweep in the presentation version. However, after discussions with the group and following Jule's advice, I decided to retain the pure sine sweep.

- **When it comes to literally making a dog head**

Zixuan:

*During the process, we ran into a shortage of cardboard. To make the most of what we had, we carefully selected the best pieces and **patched them together using transparent tape** to form the frame.*

Initially, we were concerned about whether the taped structure would hold, but once the clay was added over it, the overall form became much more solid and stable, more than we expected.

In terms of practical functionality, we also designed the heads with recording in mind. We left microphone slots on both sides of the head, aligning roughly with where a dog's ears would be, and created openings at the bottom and side for cable routing. This setup allows us to mount mics easily and connect them to recording devices, achieving a binaural recording experience that closely mimics a dog's hearing position.

Despite the simplicity of the materials, this handmade process gave us valuable insights into structural design, texture, and acoustic response. It also laid a solid foundation for the next phase of our work—testing how the different-sized dog heads affect recorded sound in the same environment and further exploring the relationship between body structure and auditory space.

Ruiqi:

I hate to say this, but… I'll never forget how embarrassing it was, running into every single shop on South Clerk Street asking for cardboard.

- **When it comes to presentation**

Zixuan:

After the participants finished the experience, we had short conversations with many of them to gather feedback. Based on their responses, I reflected on a few aspects that could be improved:

1. *VR Headset and Accessibility*
   Some participants had vision issues, such as near-sightedness or astigmatism, which made it uncomfortable for them to use the cardboard VR headset. Those with astigmatism saw double images, while nearsighted users reported dizziness. This made me realise that we hadn't fully considered the diversity of user needs during the design phase, and future iterations should take this into account.
2. *Video Transition Breaks Immersion*
   In the second part of the experience, participants had to manually switch videos between the two segments. This broke the sense of immersion for a few people. I'm considering changing it to

automatically play both videos in sequence, which would create a smoother, uninterrupted experience.

3. *Headphone Cancellation Issue*
   Our headphones weren't effective in blocking out ambient noise.Some of the more delicate audio details we designed were lost in the background noise. In the future, we may need to use more closed or noise-cancelling headphones to preserve the full quality of the soundscape.
4. *Insightful Feedback from Professor Jules*
   Professor Jules offered some thoughtful suggestions after experiencing the work. He recommended experimenting with bone conduction audio to simulate a more realistic, first-person auditory experience. He also noted that the sense of depth in the hearing experience, especially between large and small dogs, could be more pronounced. This was a detail I hadn't fully considered before, and I plan to improve this in the next version of the sound mix.

- **When it comes to sound effects creation**

Ruiqi:

What I want to talk specifically about is how the sound of the plane has been made. It was initially started with a pure Brownian noise from Audacity, then processed with ReaPitch on Reaper (first 15 seconds pitched up, latter 15 seconds pitched down on automation envelope), and so was the volume. Plus, other used plug-ins are listed below for reference.

Plug-ins for a plane flying overhead

Also, I want to explain why I was so determined to add various distortion plug-ins to these soundtracks. I was deeply moved and inspired by the film Sound of Metal *(2019, Darius Marder), which powerfully portrays how individuals with hearing loss might perceive sound — metallic, distorted, even robotic — yet rendered in an unexpectedly simple and affecting way.*

- **When it comes to creating a Deuteranopia effect**

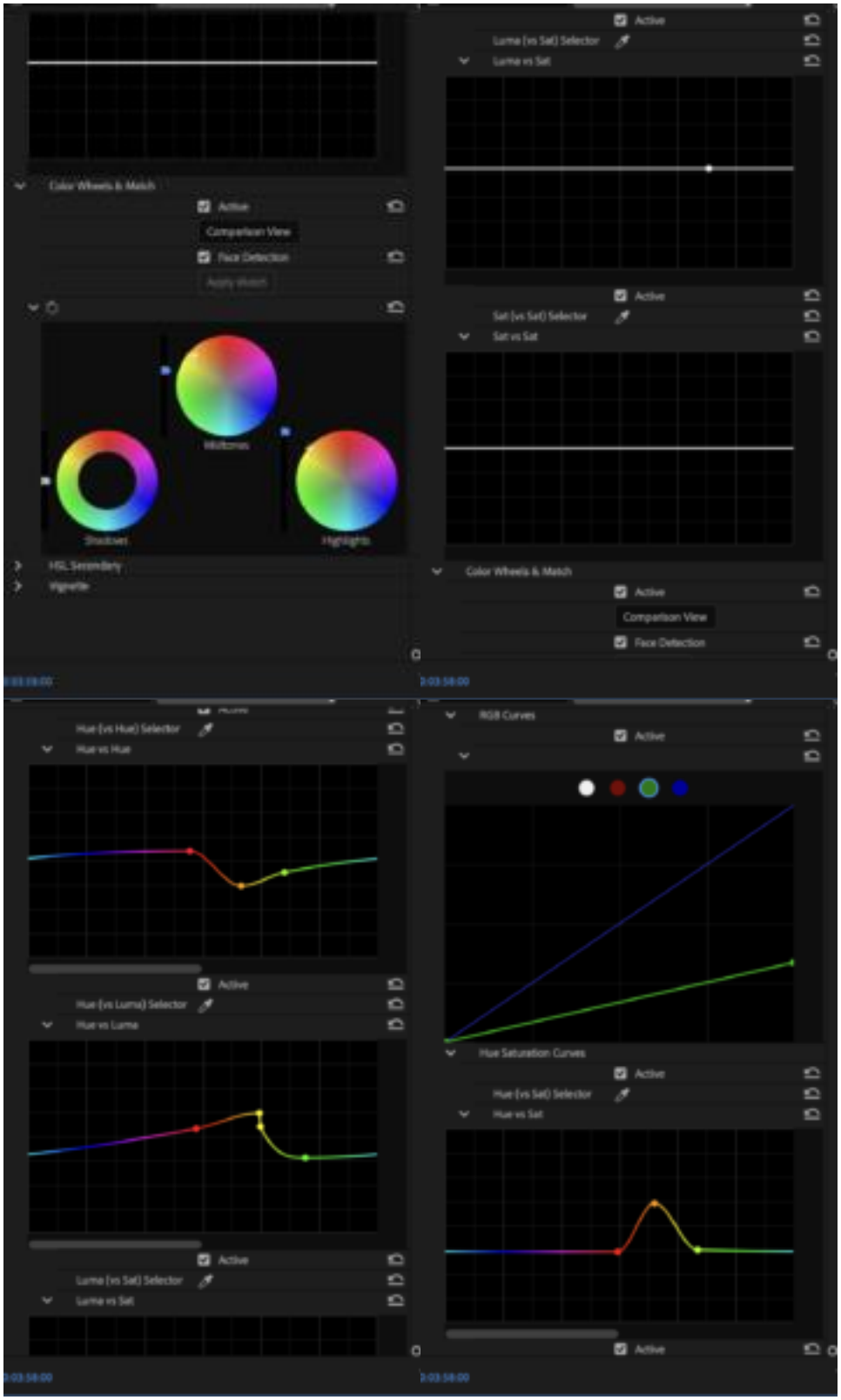
Carly:

In my case I didn't source elements outside of the videos and photos we took, but what I did however do was research how to create a Deuteranopia effect in premier pro as I already knew how to do it in photoshop, as there was a filter, but in premier pro it was a whole different deal.

The places where I obtained useful information are the following:

- *How To Use The Hue Saturation Curves In Premiere Pro CC 2023: https://youtu.be/9i47z_3JmMQ?si=Yah5CRqqrFrRiCTj*
- *Design for color blind users: https://blog.eppz.eu/design-color-blind-users/*
- *Simulate Color-Blindness in Final Rendered Project: https://community.adobe.com/t5/premiere-pro-discussions/simulate-color-blindness-in-final-rendered-project/m-p/12136770*
- *How to Simulate Color Blindness in a Video?: https://www.reddit.com/r/premiere/comments/oqhv4r/how_to_simulate_color_blindness_in_a_video/?rdt=48169*

The Lumetri colour controls ended up as this result:


Color Wheels & Match
Active
Comparison View
Face Detection
Midtones
Shadows
Highlights
HSL Secondary
Vignette
Luma (vs Sat) Selector
Luma vs Sat
Sat (vs Sat) Selector
Sat vs Sat
Color Wheels & Match
Active
Comparison View
Face Detection
Hue (vs Hue) Selector
Hue vs Hue
Active
Hue (vs Luma) Selector
Hue vs Luma
Active
Luma (vs Sat) Selector
Luma vs Sat
RGB Curves
Active
Hue Saturation Curves
Active
Hue (vs Sat) Selector
Hue vs Sat
Active

Resource Collection

https://drive.google.com/drive/folders/1GASVzuj2C-5DZzutAFRoPQyHKoN6qWwG?usp=drive_link

https://drive.google.com/drive/folders/1kyAcPqckP3G2WCSr6VAZDFAU7eypD5tE?usp=share_link

Ruiqi's acknowledgement:

The sound of a dog barking, the camera shutter is from open sound resource website, whose resource websites are listed below:

https://pixabay.com/sound-effects/search/dog-barking/

https://pixabay.com/sound-effects/search/camera-shutter/

And the sound of the street comes from my friend Zelin.

Zixuan's acknowledgement:

The sound of the dog comes from my friend Song

The sound of the street people talking comes from my friend Yu

The sound of the forest comes from my friend Shi

The sound of the bird's wings comes from my friend Xue

All the sound used here is with permission.

Submission 2 Links:

Labrador Final:

https://media.ed.ac.uk/media/t/1_3ijoperb

Blind Labrador (Presentation/ Final Version)

https://media.ed.ac.uk/media/Deaf%20Labrador%20Presentation%20Version/1_r1kdztmy

Deaf Labrador (Presentation Version)

https://media.ed.ac.uk/media/Deaf%20Labrador%20Final%20Version/1_tpv3zaug

Deaf Labrador Final Version

Chihuahua & Irish wolfhound:

https://drive.google.com/drive/folders/1bPVJsmr0vwP2Lb89HpMJszykojbboqWk?usp=share_link

References

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Marder, Darius, director. *Sound of Metal*. Amazon Studios, Caviar, 2019. 2hrs.1min. https://www.amazon.co.uk/gp/video/detail/amzn1.dv.gti.a4ba7624-e517-097c-1ab9-82595b89aef1?autoplay=0&ref_=atv_cf_strg_wb

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