



**MULTIMODAL ACCESSIBILITY SOLUTIONS  
FOR VISUALLY IMPAIRED USERS OF  
VIRTUAL WORLDS**

ALEX BRIGGS

# WHO AM I?



## ALEX BRIGGS

GAME PRODUCER & DESIGNER

### EXPERIENCE

- Invested in the games industry since 2017
  - Volunteered for Bethesda Softworks
- Student at the University of Staffordshire since 2021
  - Enrolled on Computer Gameplay Design & Production (BSc)
  - 1UP Scheme 2023 - TIGA nominated and winning games
- Interned at Criterion Games (Electronic Arts) in 2024-5
  - Produced for Battlefield 6 and Need for Speed Unbound
  - Worked with User Research and UX teams on playtesting initiatives
- Studying in the final year of my undergraduate degree
  - Final year project centred around developing for accessibility

# CONTENTS

- 1** **DEFINING ACCESSIBILITY**  
What do we mean by Accessibility?
- 2** **APPROACHING ACCESSIBILITY DESIGN**  
What does the latest research say?
- 3** **ACCESSIBILITY DESIGN PIPELINE**  
What are the steps for designing with accessibility in mind?
- 4** **SHOWCASING ACCESSIBILITY DESIGN TECHNIQUES**  
What were the methods used to create accessible action-stealth?
- 5** **LEARNINGS FOR THE FUTURE**  
What did I learn from this project and how can it be improved?

# DEFINITIONS

WHAT IS...

## ACCESSIBILITY

According to the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), **disability** can be defined as arising from...

*“the interaction between **persons with impairments** and attitudinal and **environmental barriers** that hinders their **full and effective participation** in society on an equal basis with others”*

---

OHCHR, 2006

THEREFORE...

**Accessibility can be considered the practice of avoiding, mitigating, or removing those barriers.**

# APPROACHING ACCESSIBILITY

## BARRIERS

Barriers relate to the human body as an **I/O interface** with virtual worlds

These include cognition, hearing, motor, vocalisation, or **vision**

Some of these barriers cannot be removed **without drawbacks**

Therefore, the focus should be on **eliminating unnecessary barriers**

## 3 PILLARS

Ian Hamilton,  
Accessibility Consultant  
(2022)

1

### GUIDELINES

Best practices from case studies and proven examples

2

### EXPERT ADVICE

Experts who can contextualise guidelines for a given project

3

### COMMUNITY

User research to validate accessibility solutions

# VISUAL ACCESSIBILITY

## GUIDELINES

- 1 CHALLENGE**  
The player must feel challenged, otherwise interest will wane
- 2 AMBIENCE**  
The richness of the in-game world should be communicated
- 3 PARTICIPATION**  
Players should be able to communicate with others in multiplayer
- 4 STORY**  
Players should be able to comprehend and follow along

## EXPERTS & COMMUNITY

*Taking Video Out of the Game (2025) by Brandon Cole*

User testing with visually impaired playtesters OR simulated

**CAPS  
TEST**

BPAG 2024, RNIB

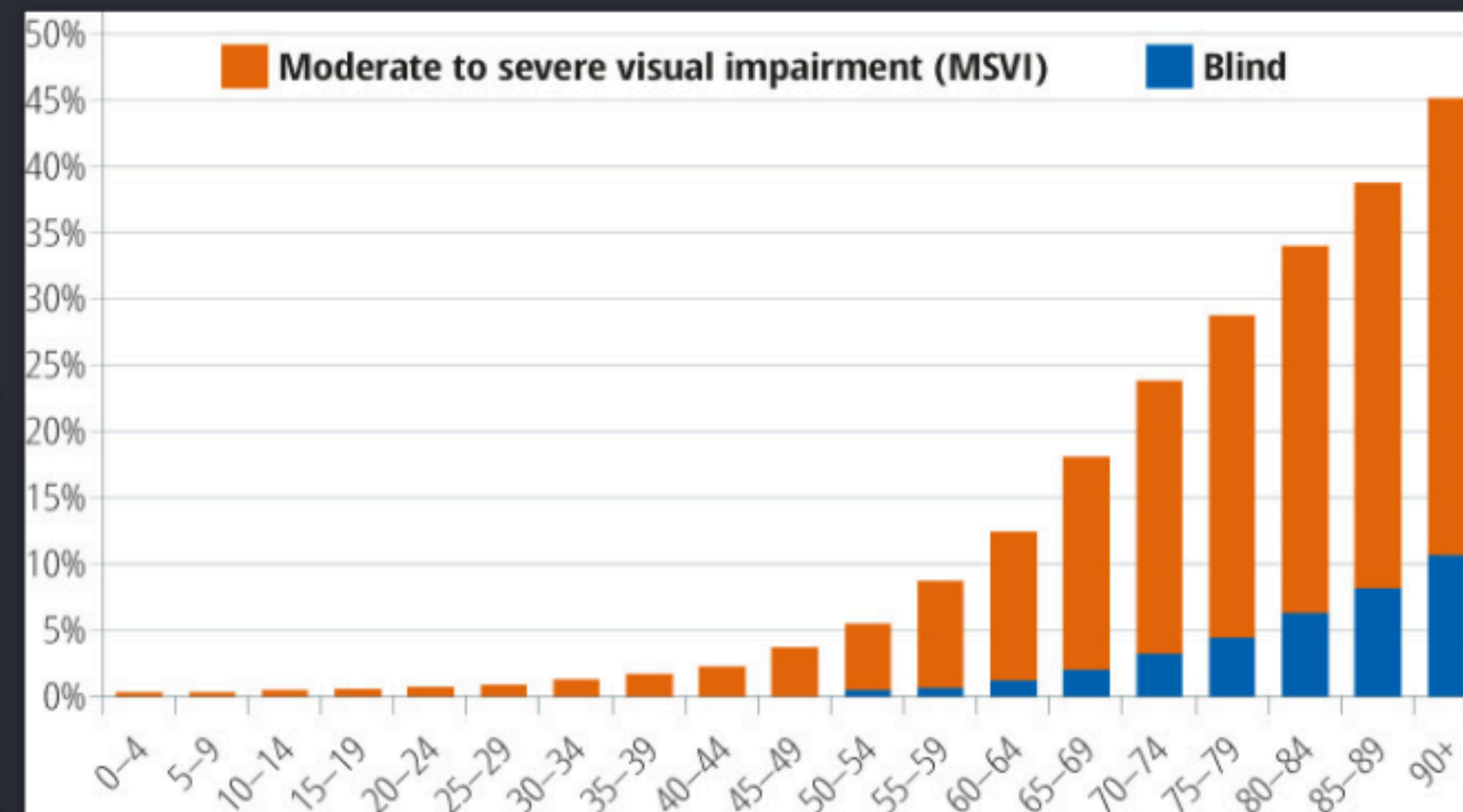


# VISUAL IMPAIRMENT

## THE STATS

Approximately **2.2 billion people globally** experience some form of visual impairment.

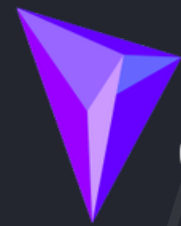
World Report on Vision, World Health Organisation (2019)



National Library of Medicine, US Government (2018)

# MULTIMODULARITY

## AUDIO



trueSpatial  
atmoky



Near-Field  
Effects



Precise  
Directivity



Realistic  
Occlusion



## HAPTICS

- Uses Force Feedback (Unreal Engine 5's built-in controller vibration and rumble functionality)
- Expandable to PlayStation DualSense controllers

## ACTION-STEALTH FRAMEWORK



- Detection States
- Programmable Guards (including Assassinations)
- Item Pickups (including Throwables)

1011's Stealth System UE5 Plugin

# ACCESSIBILITY PIPELINE

## ⚠️ PROBLEM

Blind players are **unable to rely on visual cues** to navigate complex 3D spaces, so a navigation assist feature is required to allow players to progress the level independently.

The aim for this system is to **instil confidence** within the player that they can use this feature at any time to guide them towards their next objective.

## 🔍 RESEARCH

Research was conducted into **pre-existing games** that already incorporate some form of navigation assist.



1428: Shadows over Silesia (2022)



Forza Motorsport (2023)



The Last of Us Part II (2020)

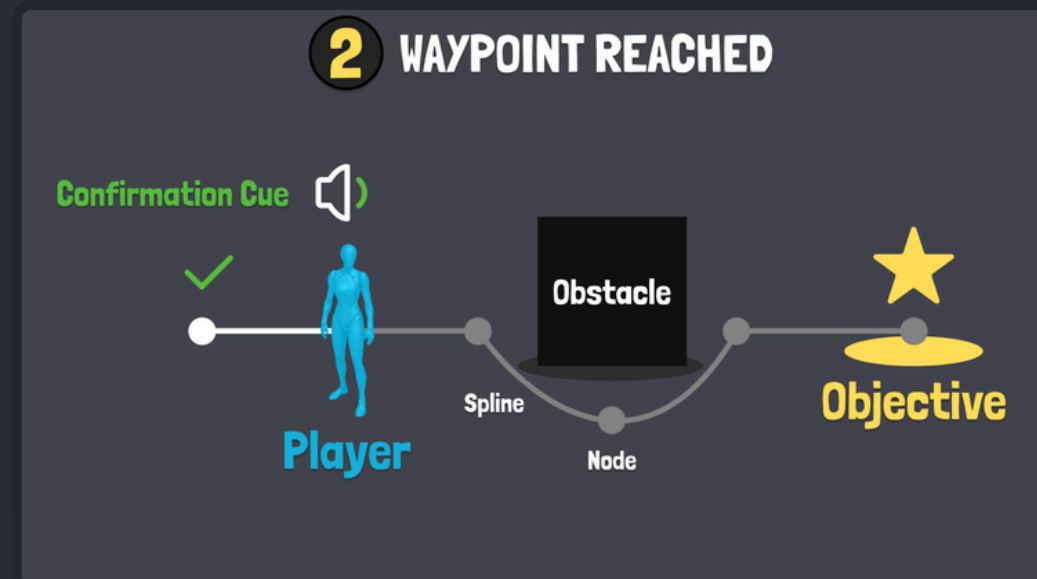
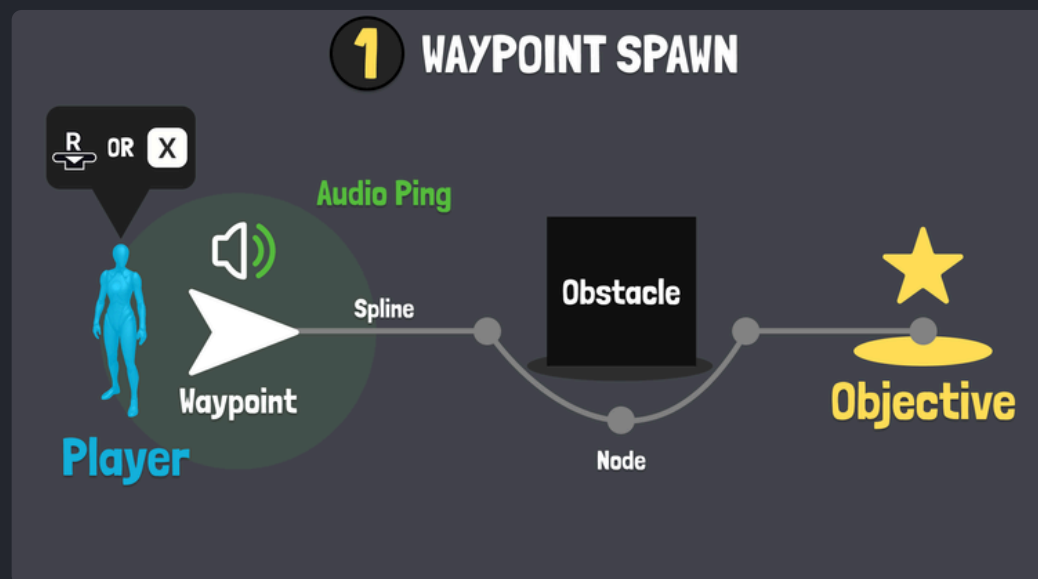
# ACCESSIBILITY PIPELINE



## IDEATION

The navigation system should aim to fulfil the following criteria:

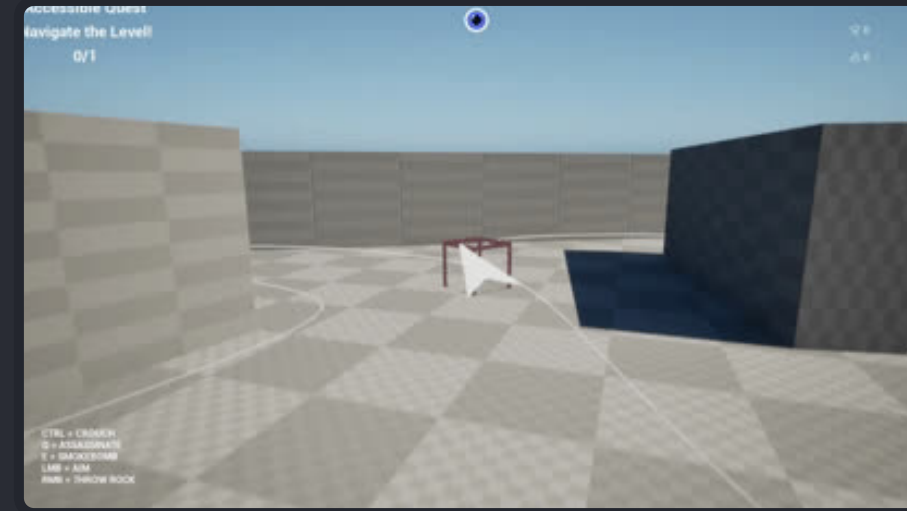
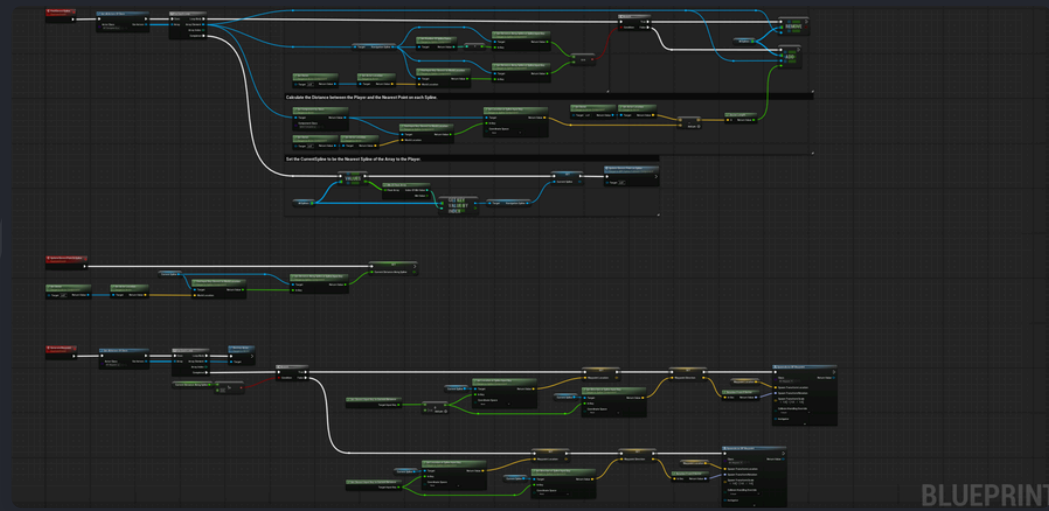
- Waypoints should **produce audio cues** to help guide the player.
  - Leveraging the spatialisation of atmoky's trueSpatial plugin.
- Waypoints should spawn along a path **towards the player's next objective**.
  - While supporting the circumvention of obstacles that block the path.
- Waypoints should be **activated by player input**.
- Players should feel empowered to use the waypoints **at any time**.



# ACCESSIBILITY PIPELINE

## ⚙️ IMPLEMENTATION

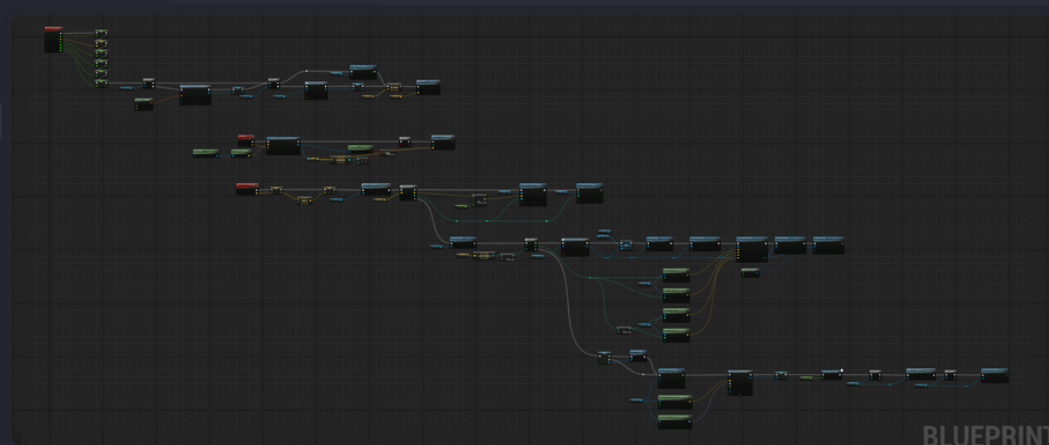
UNREAL ENGINE 5  
SPLINE SCRIPTING &  
METASOUNDS



MANUAL  
WAYPOINTS

## 🧪 TESTING & ITERATION 🔄

UNREAL ENGINE 5  
NAVMESH  
PATHFINDING



AUTOMATED  
WAYPOINTS



# TECHNIQUE SHOWCASE

## NAVIGATION ASSIST



SPATIALISED  
AUDIO WAYPOINTS

CAMERA  
NUDGING

HIGH-PITCHED  
TINTINNABULATION

CONTRASTING  
ARROWS

CONFIRMATORY  
CUES

WALL  
COLLISION  
HAPTICS

# TECHNIQUE SHOWCASE

## ITEM SCANNING



SPATIALISED  
AUDIO CUES

AGNOSTIC CUES  
FOR EXPLORATION

AUDIO OCCLUSION  
(LPF - REMOVES  
HIGH FREQUENCIES)

PICKUP PROMPTS  
TRIGGER  
PERTINENTLY

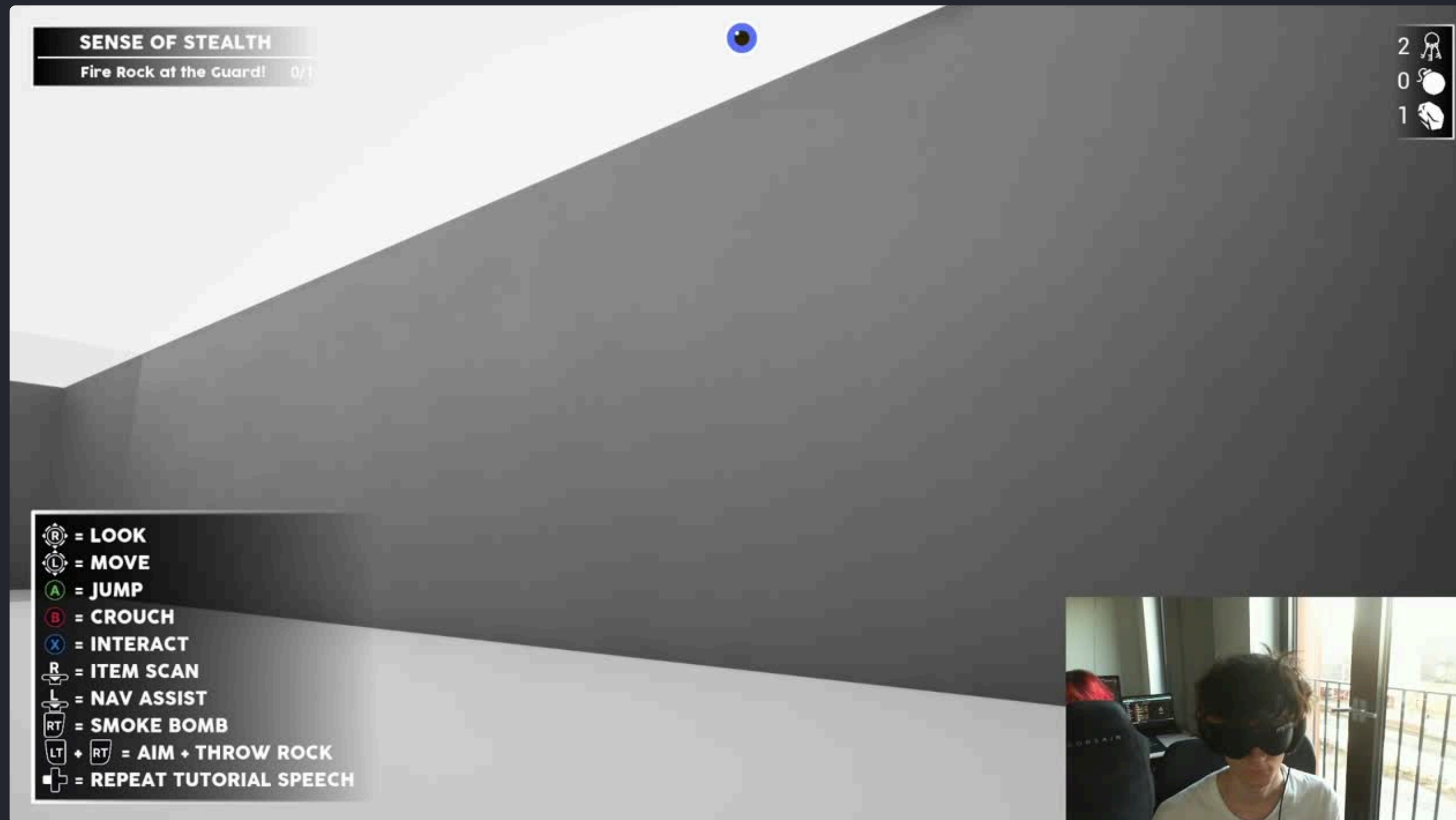
CONTRASTING  
HIGHLIGHTS

SCANNED X-RAY  
VISION



# TECHNIQUE SHOWCASE

## DETECTION



HEARTBEAT TO  
COMMUNICATE  
DETECTION STATE

ENEMY BREATHING  
TO COMMUNICATE  
SUSPICION

GRACE PERIOD TO  
AFFORD  
REPOSITIONING

REVERB FOOTSTEPS  
ALLOW FOR ENEMY  
TRACKING

AUDIO FOCUSING  
TO WARN PLAYERS  
OF ENEMY VISION

CROSSFADING  
BETWEEN STATES

# TECHNIQUE SHOWCASE

## THROWABLE AIMING



WIND UP  
SKEUOMORPHIC  
SOUNDS

PITCH MODULATION  
OVER DISTANCE

LOW PITCH  
TARGETING CUE

WALL COLLISION  
HAPTICS AGAIN

ENEMY COLLISION  
HAPTICS

VISUALLY  
HIGHLIGHTING  
TARGETS



# LEARNINGS FOR THE FUTURE

## POTENTIAL IMPROVEMENTS

Alleviate some of the **pain points** that exist for undershooting or overshooting movement, as well as lock-on for throwable aiming.

Leverage the strong foundations of the project to incorporate accessibility solutions for the **partially-sighted** user group, as the original scope intended.

Incorporate **medically blind** individuals into the user testing process to **expose any variation** in behaviour, characteristics, or player habits.

## RELEVANCY TO PRODUCTION

Accessibility is a **mindset** - evaluate how information is communicated for each facet.

Developing for accessibility can be done at any stage of development - **sooner the better!**

Producers are well-positioned to help **champion accessibility** within development teams.

# BIBLIOGRAPHY

## REFERENCES

- Stealth gameplay framework plugin (UE 5.6): *1011's Stealth System* | [LINK](#)
- Audio spatialisation plugin (UE 5.6): *atmoky trueSpatial* | [LINK](#)
- Raw audio files (except TTS): Zapsplat | [LINK](#)
- Icons for in-game UI (except input prompts): Game-icons.net | [LINK](#)
- Icons for input prompts: Julio Cacko | [LINK](#)
- Menu narration TTS (Amazon Kendra): TTS Tool | [LINK](#)
- Font for in-game UI: Cocogoose Pro | [LINK](#)

## CITATIONS

- *Convention on the rights of persons with disabilities* (2006) OHCHR. Available at: <https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities> (Accessed: 24 February 2026).
- Webster, A. (2020) *The Last of Us Part II isn't just Naughty Dog's most ambitious game – it's the most accessible, too*. The Verge. Available at: <https://www.theverge.com/21274923/the-last-of-us-part-2-accessibility-features-naughty-dog-interview-ps4> (Accessed: 24 February 2026).
- Isbister, K. and Hodent, C. (2022) 'Accessibility Then and Now', in *Game usability: Advice from the experts for advancing UX strategy and practice in videogames*. 2nd edn. Boca Raton, FL: CRC Press, Taylor & Francis Group, pp. 85, 249, 256-7.
- *RNIB Best Practice in Accessible Gaming 2024 [BPAG2024]* (2024) RNIB. Available at: [https://media.rnib.org.uk/documents/RNIB\\_Best\\_Practice\\_in\\_Accessible\\_Gaming.pdf](https://media.rnib.org.uk/documents/RNIB_Best_Practice_in_Accessible_Gaming.pdf) (Accessed: 24 February 2026).
- Cole, B. (2025) *Taking video out of the game a game developer's Guide to Total Blind accessibility*. S.l.: CRC PRESS, pp. 41–44.

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*Imagine if someone like Stephen Hawking was never given a voice to share his thoughts, and imagine how many more disabled people out there could have that opportunity if you make your products accessible for people.*

- Ross Minor, Blind Game Accessibility Consultant, SXSW 2024 Innovation Award Winner

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# THANK YOU FOR LISTENING!

ANY QUESTIONS?

## CONTACT



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