VR Twitch Prototype Development Report

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PART 1

Applying Norman's Design Principles to VR - Affordance

Objective

My objective is to define and implement Don Norman's affordance principle in my VR project.

VR Controller Design Exploration

Controller Overview

The controller I'm using is the Quest 2's Oculus Touch Controllers, the buttons and the analog in the controllers are similar to what a gaming console joysticks have.

Physicality and Button Placement

- The controllers are meant to be handy and compatible, so that the users don't feel that as a burden using it.
- **Visibility:** The buttons are placed in the way that it's easily visible and nothing is hidden.
- **Feedback**: Haptic or visual cues for button presses.
- **Mapping**: Logical placement of buttons for easy reach and association with VR functions
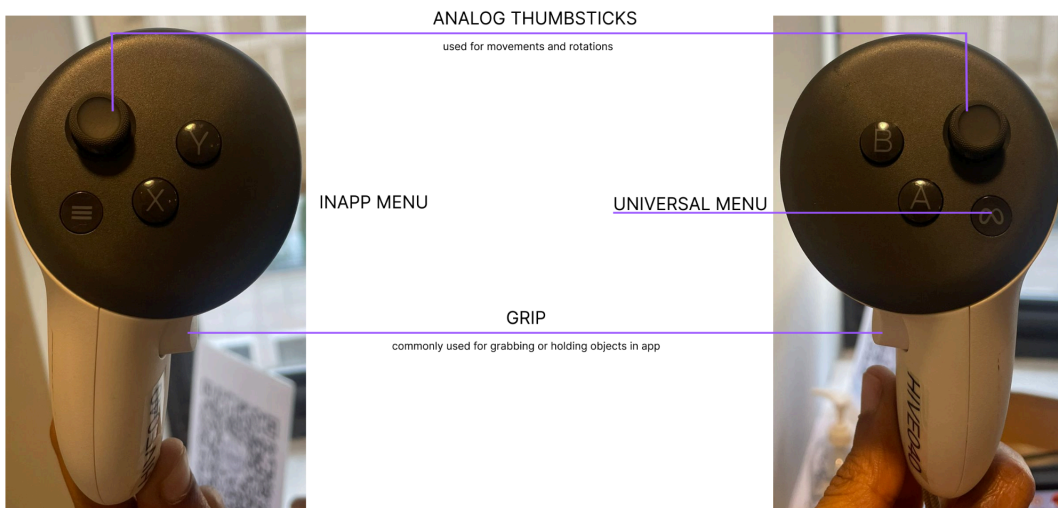
TRIGGER

used for trigger events. (shooting, painting etc)

Comprehensive List of Affordances

1. Grabbing objects
2. Pulling triggers to shoot
3. Rotating objects
4. Sword
5. Scrolling
6. Ice Cream
7. Knife
8. Flicking switches
9. Drawing/painting
10. Opening doors
11. Selecting menu items
12. Torch
13. Plane Controller
14. Glass
15. Stick
16. Punching
17. Holding tools
18. Gun
19. Pulling rope
20. Climbing

Imagery for Five Selected Affordances

Affordance 1 - Knife

- **Usage**: The knife can be used to cut vegetables or fruits.
- **Interaction**: Grabbing the knife using the **trigger button** allows users to replicate real-world cutting actions.
- **Feedback**: A small collision and movement simulate the cutting process.

Affordance 2 - Gun

- **Usage**: The gun can be used to shoot objects.
- **Interaction**: Pressing the **trigger button** fires bullets.
- **Feedback**: Haptic vibrations and visual cues (e.g., bullets exiting the gun barrel) provide confirmation.

Affordance 3 - Driving a Car

- **Usage**: Users steer the car using a virtual steering wheel.
- **Interaction**: Grab the steering wheel and move hands **clockwise** or **anticlockwise** to turn the car.
- **Feedback**: Rotating the wheel triggers car movement.

Affordance 4 - Painting

- **Usage**: Hold a brush in one hand and a palette in the other to paint.
- **Interaction**:
    - **Trigger button** to hold the brush.
    - Palette auto-sockets to the other hand.
    - Dipping the brush in the palette changes its color (visual feedback).

Affordance 5 - Mug

- **Usage**: Users can grab and carry the mug.
- **Interaction**: Use the **trigger button** to hold the mug.
- **Feedback**: Releasing the button drops the mug, simulating gravity.

Affordances Used in Twitch VR

1. **Scrolling**: Users can scroll through video lists using the joystick.
2. **Selecting Streams**: Users can point and click to select a stream.

PART 2

Twitch VR

Overview

Introduction

In this project, I set out to design and develop a functional VR prototype of Twitch, the leading live streaming platform for gamers and creators. With virtual reality growing in popularity, I wanted to explore how Twitch could be reimagined in VR to provide an immersive viewing experience and new interaction opportunities.

Tools Used

- **Unity**: Game engine for VR development.
- **Oculus Link**: Testing and previewing VR interactions.
- **Figma**: Designing the user interface (UI) and components.
- **ChatGPT**: Assisted with C# scripting logic.
- **Visual Studio**: Writing scripts to control interactivity and transitions.

Aim

Creating a VR version of Twitch to provide an immersive streaming experience, ideal for users who spend extensive time on Twitch when bored.

Goals

The goal was to design a functional, user-friendly VR version of Twitch that allows users to:

1. **Browse and select** live streams on a Home Screen.
2. Watch videos in an immersive **Video Screen** with key details about the streamer.
3. Transition to a distraction free **FullScreen** Mode for focused content viewing.

Success Criteria

- Smooth navigation between **Home**, **Video Screen**, and **Full-Screen Mode**.
- Intuitive interactions: scrollable content, clickable buttons, and transitions.
- A polished VR experience demonstrating my skills in UI design, Unity development, and environment building.

Feature Selection

- Focused only on **core features** to maintain simplicity:
  - **Scrollable lists** of live channels or videos.
  - **Interactive buttons** for selecting streams and transitioning screens.

Methods

Concept Development

- Identified Twitch's essential features and simplified the VR design to include:
  - **Home Screen**
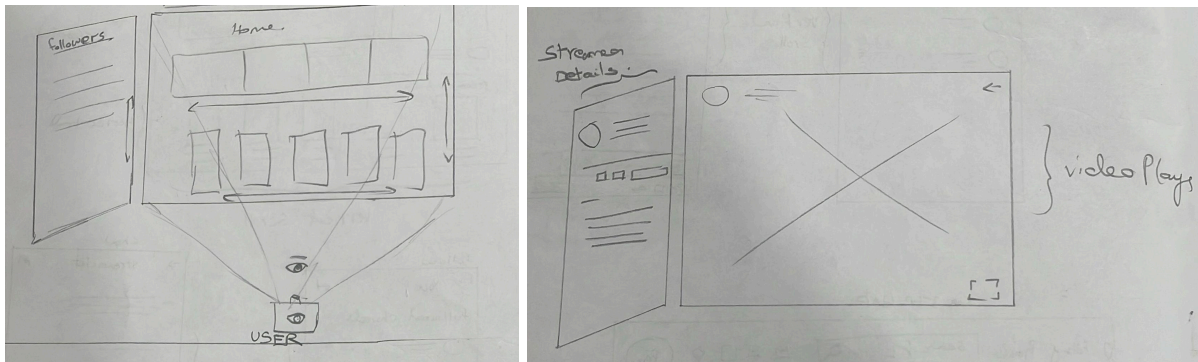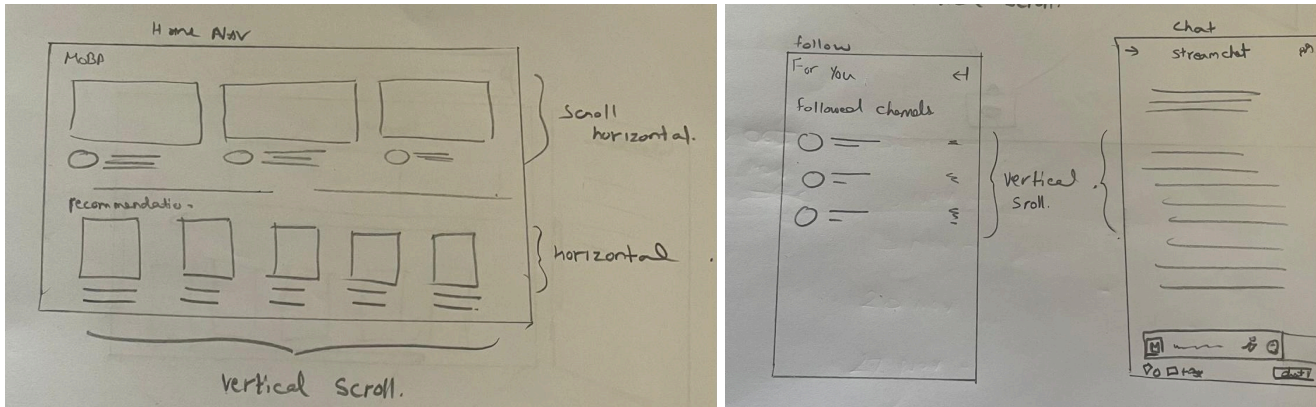 - **Video Screen**
  - **Full-Screen Mode**

Research and Refinement
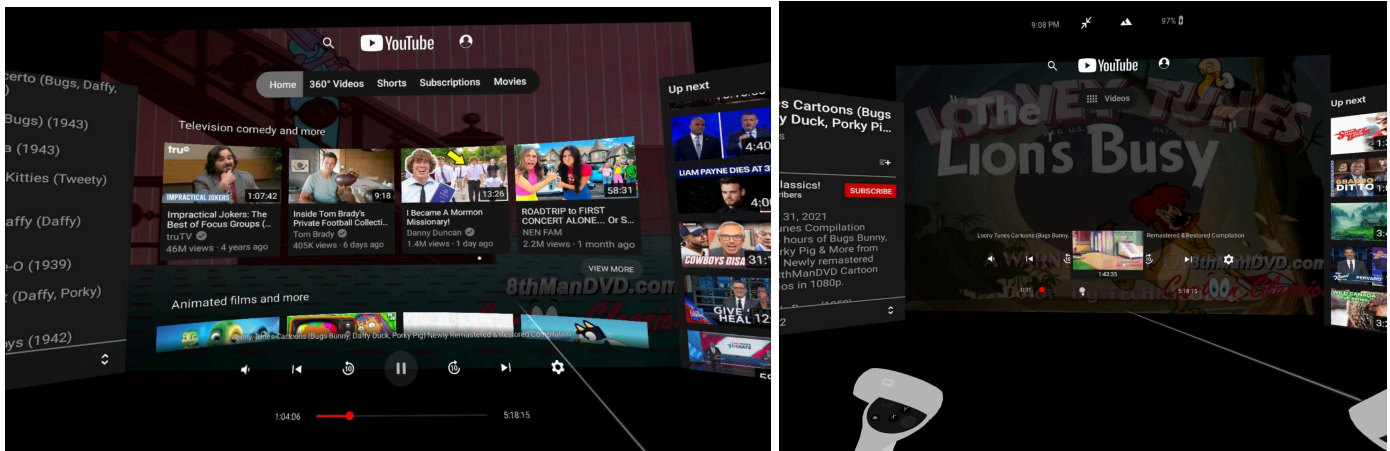
- I referenced **YouTube VR** and VR UI design articles, which influenced the layout and feature accessibility, ensuring clarity and focus on key elements for VR.

Sketches and Annotations

- Created **hand-drawn sketches** to annotate VR elements.


- These sketches helped define the primary VR design elements and interaction areas based on VR design best practices and user needs in a VR setting.

Implementation in Unity

- I began by designing Twitch's core UI in Figma, focusing on the main home screen layout and essential components.
- After finalizing the design, I imported UI elements into Unity as sprite images, aligning and scaling them within a World Space Canvas to achieve proper VR placement.
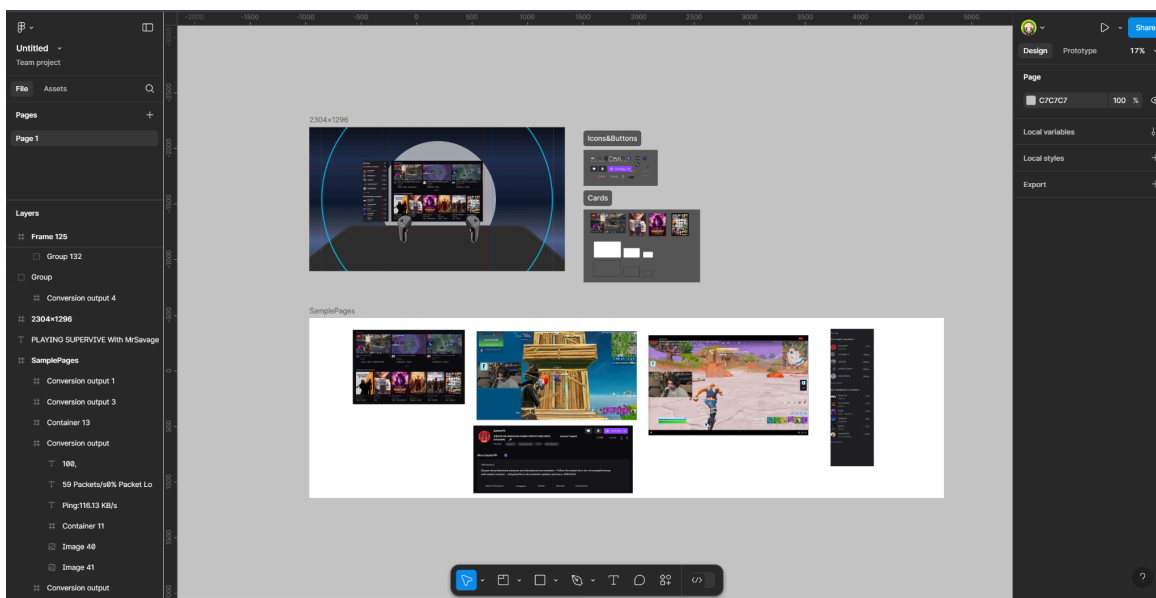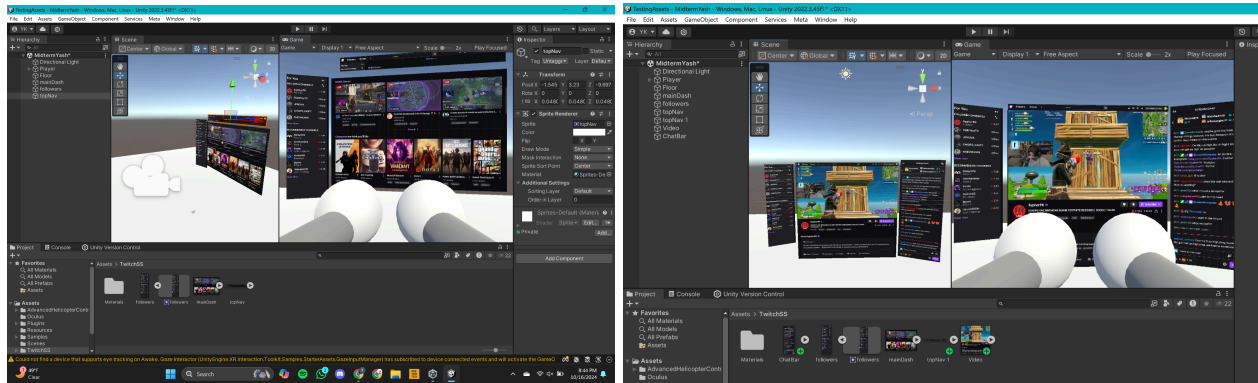
Design Process
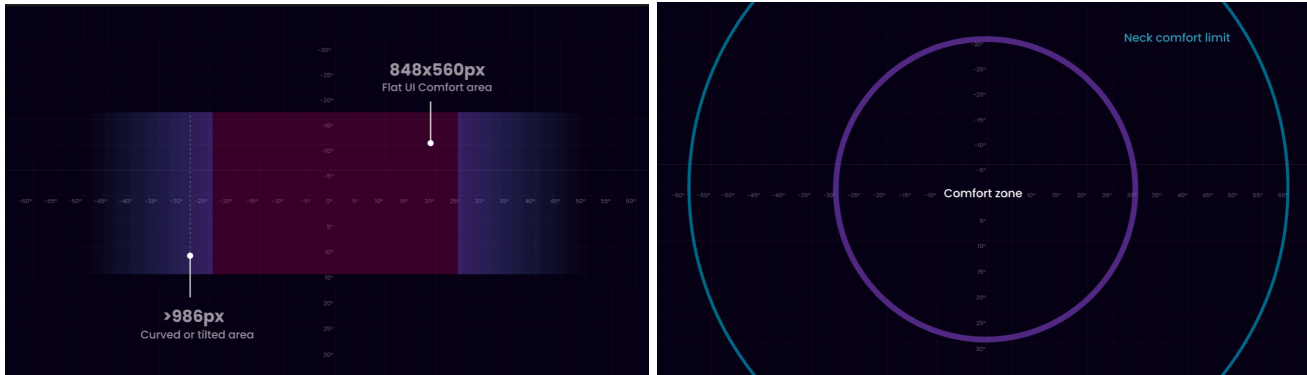
Distance between user and screen:3 meters.

Screen Size: (3.5,3,0)

- The design made sure that the important features are to be in the comfort zone and the secondary features to be not beyond the neck comfort zone.

- Before starting with the design I took screenshots of the twitch desktop version to see how the UI we are looking in Vr world. This helped to prioritize the important features and align the UI.

Created interactions

- Implemented a scroll view for browsing channels, along with custom scripts to manage joystick input for VR scrolling.
- All the channels act like a button, which leads the user to view the stream.
- The details of the current stream can be viewed on the left side of the video frame. This panel includes the details and actions like subscribe, notify, follow, streamer name, description etc.

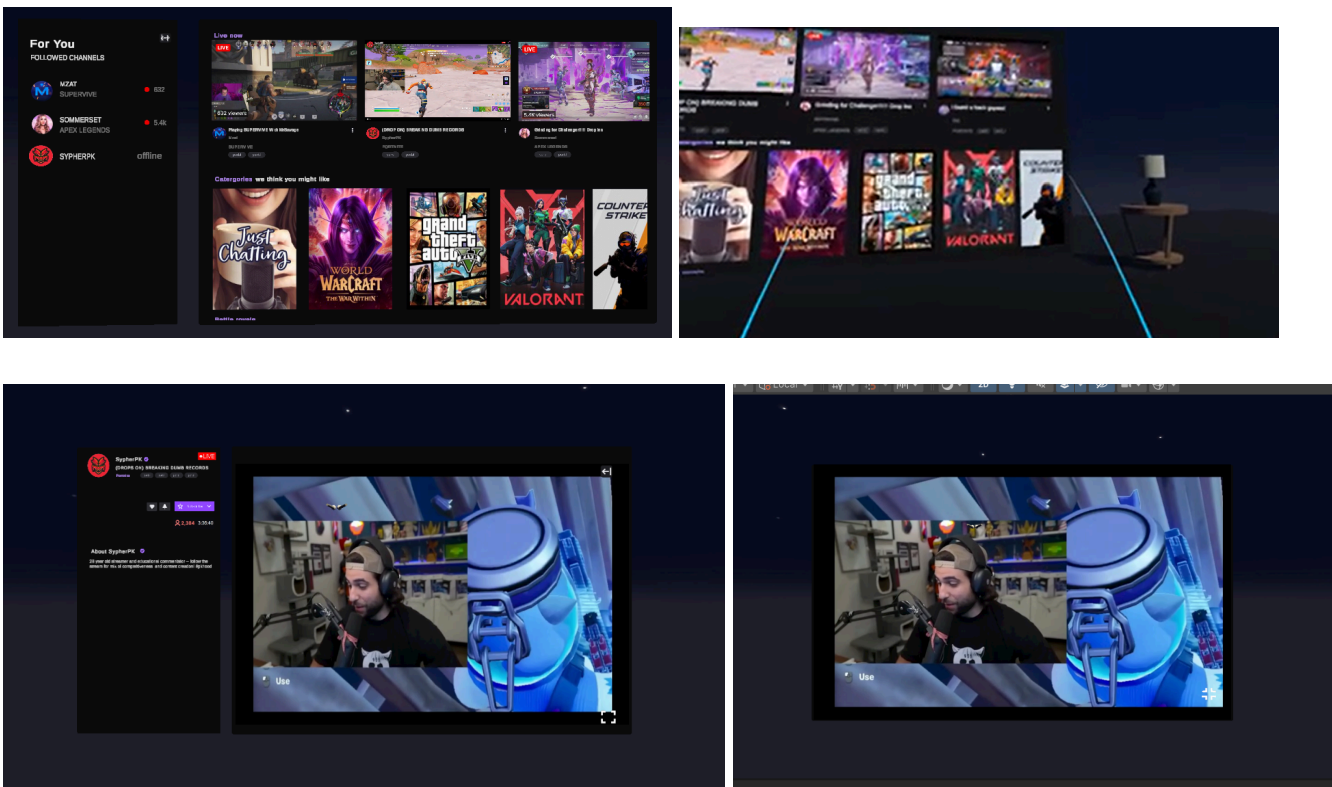● The stream can be viewed in full screen mode too.

Scripting

Wrote C# scripts with help of chatGPT for Screen transitions (Home → Video Screen → Full-Screen).
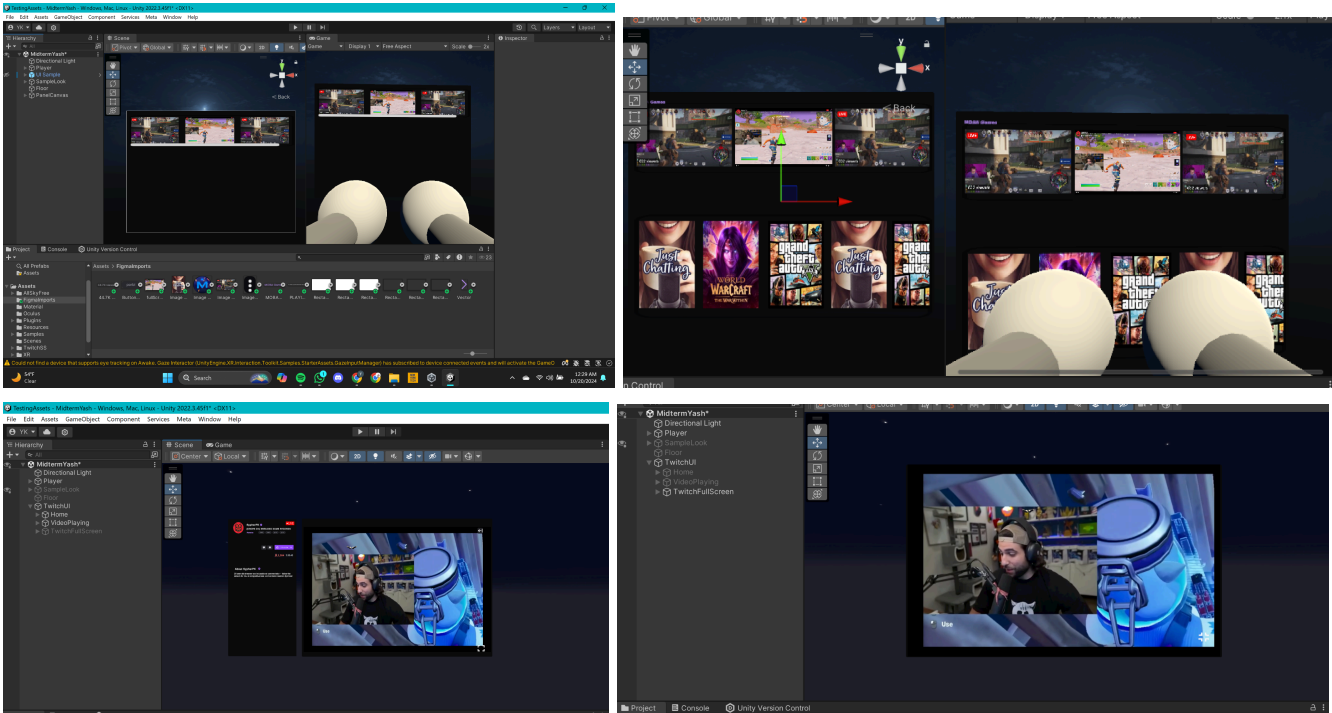
Final Output:

Challenges

Challenge 1: Scrolling in VR

- **Issue:** Implementing scroll functionality in Unity differed significantly from Figma prototyping.
- **Solution:** I watched YouTube tutorials, sought assistance from my professor on VR scrolling techniques and experimented within Unity, adjusting settings and interactions to create smoother, more intuitive scrolling.

Challenge 2: Button-Based Screen Transitions

- **Issue:** Ensuring that buttons trigger seamless screen transitions.
- **Solution:** Created scripts to toggle visibility of panels with help of ChatGPT and assigned the methods to buttons using Unity's OnClick() events.

Results

Key Achievements

1. **Home Screen**: Scrollable video lists and left panel for followed streamers.
2. **Video Screen**: Streamer details and video playback with a Full-Screen button.
3. **Full-Screen Mode**: Distraction-free, immersive video viewing.

Next Steps

- Expand the VR interface to include additional Twitch features like live chat and subscription management etc.
- Test the prototype with users to gather feedback and iterate further.

Conclusion

This project successfully demonstrates how Twitch can be reimagined for VR to deliver a unique, immersive streaming experience. By focusing on core functionality and adhering to VR design principles, I created a refined prototype featuring a Home Screen, Video Screen, and Full-Screen Mode.

References

https://www.youtube.com/watch?v=mW8tRQRQD74&t=261s
https://creator.oculus.com/getting-started/media-production-specifications-for-delivery-to-meta-quest-2-headsets/
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