Testing Plan – Interactive Prototype 3

Extended Reality Video Workspace

Project Concept

This third prototype continues the development of the *Extended Reality Video Workspace*, which reimagines Adobe Premiere Pro's core video editing features in an immersive XR environment using Meta Quest.
Building upon the previous prototype, this version focuses on extending the user's interactive control of video clips in 3D space. In addition to grabbing and placing floating video clips, users can now **trim videos by grabbing it and resizing them horizontally**, simulating real timeline editing in XR.

The purpose of this prototype is to explore whether natural spatial gestures (grabbing, dragging, resizing) feel intuitive and precise enough to replace traditional 2D mouse-based editing controls in immersive environments.

Testing Objective

The testing session aims to evaluate the **usability, intuitiveness, and interaction clarity** of two new XR-based editing functions:

1. **Grabbing and Spatial Placement**
   Determine if users can easily pick up floating video clips and place them anywhere in the environment with proper control and alignment.

2. **Trimming Interaction**
   Assess whether users can intuitively understand how to grab the video and trim it by moving it horizontally, maintaining natural feedback and control.

Validation Goals

- Users should be able to grab and place videos without struggling to pick them up or align them.

- Users should perform trimming smoothly without confusion about where to grab or how to move it.

Testing Methodologies

1. Method

Task-Based Usability Testing
Participants will attempt to complete two interactive tasks — grabbing & placing, and trimming — while thinking aloud.

Observation and Think-Aloud Protocol
Participants will describe their thoughts and reasoning while performing actions, providing insight into intuitiveness and confusion.

Metrics Collected

- Task completion success
- Errors or failed attempts
- Observed hesitation or confusion
- Verbal feedback on ease of use

Prototype Description / Requirements

The prototype, developed in **Unity using Meta All-in-One SDK**, includes:

- **Floating Video Panels**: Grabbable video cubes in 3D space.
- **Editing Panel**: A large, flat surface to place the videos.

Data Collection Methods

- **Quantitative:** Task completion rates, number of errors
- **Qualitative:** User comments (verbal feedback), observations of body movement and gestures.
- **Behavioral:** Noting confusion, hesitation, or repeated failed actions to identify usability challenges.

Testing Setup

- **Hardware**: Meta Quest headset connected to Unity prototype.
- **Environment**: Quiet room with minimal distractions; calibrated XR setup.
- **Recording**: Recording of think-aloud session.
- **Participant Briefing**: Explain purpose, obtain consent, and introduce XR controls.

Testing Process (Schedule/Time)

1. Introduction & Consent (1 min)

- Welcome participant, explain study goals, confirm consent.

2. Prototype Explanation (1 min)

- Provide a short overview of XR environment and the two main interactions (grab/place, trim video).

3. Task Execution (6–8 mins)

Participants will complete the following tasks:

- **Task 1**: Select a floating video, grab it, and place it anywhere in the environment.
- **Task 2**: Ask the participant to grab one end of the video and resize it horizontally, simulating trimming.

4. Feedback Session (2–3 mins)

- Ask participants how intuitive the interactions felt.
- Gather feedback on differences compared to traditional editing.
- Ask for suggestions to make placement or dragging more natural.

5. Wrap-Up (30 seconds)

- Thank participants and end the session

Post-Test Interview Questions

1. How easy was it to grab and place the videos in the 3D space?

2. Did you clearly understand how to trim the video by grabbing its sides?
3. Did trimming feel smooth and realistic, or did it need more feedback or precision?
4. What part of the interaction felt most natural or most confusing?
5. What improvements would make this editing process more intuitive?

Research Summary

Research on XR interaction design emphasizes **embodied cognition**, how physical gestures enhance spatial understanding and task efficiency in immersive environments (Jerald, 2015; Billinghurst et al., 2019). Studies show that **direct manipulation** (e.g., grabbing, resizing, or trimming) in VR increases user engagement and memory retention (Steed et al., 2020). Additionally, **affordances and visual feedback** are critical in reducing cognitive load, especially for new users (Norman, 2013).
These findings justify testing trim-based interactions in XR, as they simulate real-world manipulation, providing intuitive and hands-on editing experiences.

References

- Jerald, J. (2015). *The VR Book: Human-Centered Design for Virtual Reality.* ACM.
- Billinghurst, M., Clark, A., & Lee, G. (2019). *A Survey of Augmented Reality. Foundations and Trends in Human–Computer Interaction.*
- Steed, A., et al. (2020). *Evaluating Spatial Interaction Techniques in Immersive Virtual Environments.* IEEE Transactions on Visualization and Computer Graphics.
- Norman, D. (2013). *The Design of Everyday Things.* Basic Books.