Tell Me How You Play: Exploring Ways to Enhance the Gaming Experience in Asymmetric Multiplayer VR Games through Affective State Visualization

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OBJECTIVES

- Asymmetric multiplayer games, featuring varied roles and goals, demand more social interaction than symmetric games
- Earlier research on physiological feedback in VR games excluded asymmetric multiplayer contexts
- Investigations focused on enhancing the gaming experience in asymmetric multiplayer VR games by visualizing players' emotional states

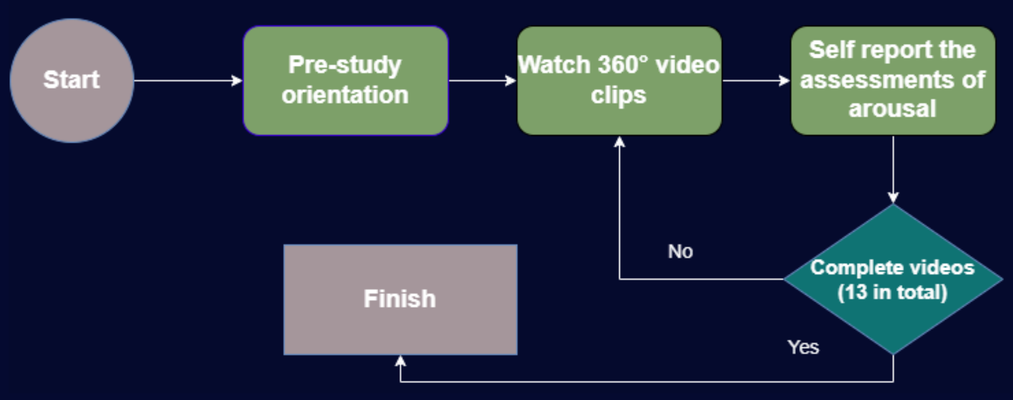
BINARY AFFECTIVE STATE INFERENCE ALGORITHM

- Developed an algorithm to deduce gamers' emotional states from EEG signals, focusing on alpha and beta brain waves
- Calculated arousal by comparing average beta power in the frontal region with alpha power in the parietal region

$$Arousal(t) = \frac{\beta_{frontal}(t)}{\alpha_{parietal}(t)} = \frac{\beta_{F3}(t) + \beta_{F4}(t)}{\alpha_{P7}(t) + \alpha_{P8}(t)}$$

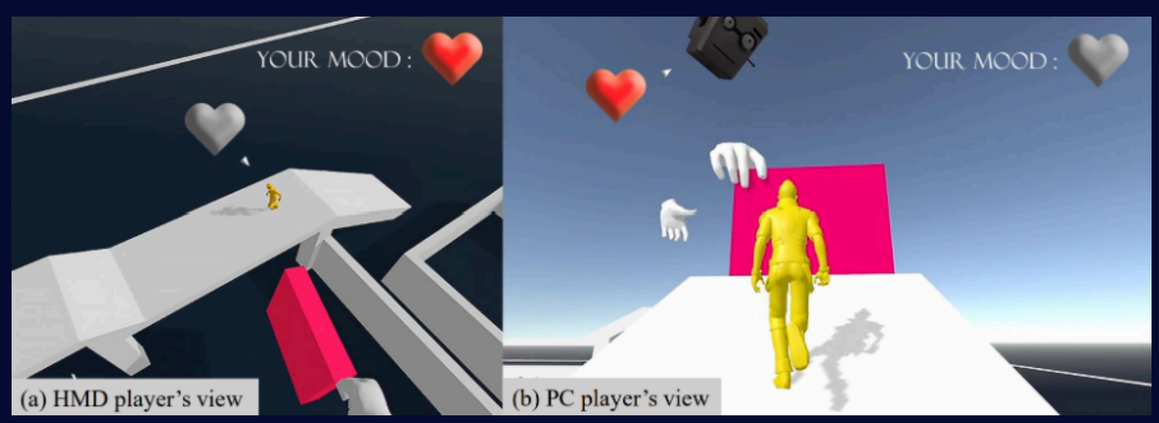
PILOT STUDY

- Participants: Recruited 11 volunteers who watched 90-second video clips to elicit varying arousal levels
- Results: The algorithm achieved 72.73% accuracy, comparing self-reported arousal with inferred classifications

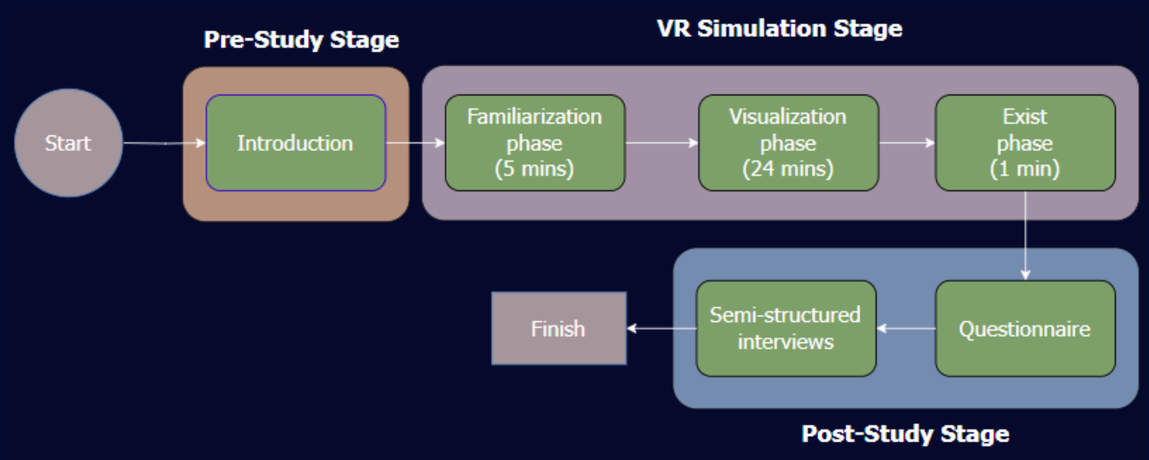


PRELIMINARY STUDY DESIGN

- Planning to investigate the impact of visualized affective states on the overall experience of asymmetric multiplayer VR games
- Affective Asymmetric Multiplayer VR Game: Designed an emotionally engaging asymmetric multiplayer VR game with an interface that exhibits the affective states of all players
  - Displaying the emotinoal arousal states of players (red/grey hearts) to reduce asymmetry between players



- Players Planned Study Procedure:



- Planned Data Analysis: Will conduct post-game Q&A sessions, questionnaires, and interviews to gather qualitative data

FUTURE WORK & CONCLUSION

- Improving the binary affective state inference algorithm's accuracy and develop asymmetric multiplayer VR game
- Recruiting participants to conduct broader user studies to further assess the effects of affective state visualization on the gaming experience

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