Title:

Exploring the impact of Competition and Cooperation on Performance and Engagement in VR Exergaming

Description:

This project aims to explore how different VR cycling scenarios, each with distinct cooperative and competitive dynamics, impact user performance, engagement, and fitness outcomes. The study will use surveys, personality tests, questionnaires, and fitness tracking data such as heart rate, power, cadence, to gather insights into the effectiveness of different scenarios based on social dynamic and personality type.

Phase 1: Baseline Scenario:

Participants will perform the following:

1. Participants will complete a personality test prior to participating in the study.
2. Participants will complete a ramp fitness test on the exercise bike in the baseline scenario in the VR application.
3. Participants will complete both quantitative and qualitative feedback surveys and questionnaires on the scenario they just completed.

Phase 2: Cooperative Scenario:

Participants will perform the following:

1. Participants will complete a ramp fitness test on the exercise bike in the cooperative scenario in the VR application.
2. Participants will complete both quantitative and qualitative feedback surveys and questionnaires on the scenario they just completed.

Phase 3: Competitive Scenario:

Participants will perform the following:

1. Participants will complete a ramp fitness test on the exercise bike in the competitive scenario in the VR application.
2. Participants will complete both quantitative and qualitative feedback surveys and questionnaires on the scenario they just completed.

Inclusion Criteria:

* Age: 18 years or older.
* Health Status: Must be in generally good health, with no known medical conditions what would make high intensity cycling unsafe.
* VR Compatibility: No history of severe motion sickness or epilepsy triggered by VR.
* Cycling Experience: Open to all fitness levels, from beginners to advanced cyclists.
* Technology Familiarity: Comfortable using a VR headset, but no prior VR experience is required.
* Availability: Must be able to complete all three cycling scenarios within the study timeframe.

Exclusion Criteria:

* Medical Conditions: Individuals with heart disease, uncontrolled high blood pressure, respiratory issues, or joint injuries that could be aggravated by cycling.
* Severe VR Motion Sickness: if prone to nausea, dizziness, or disorientation in virtual environments.
* Neurological Conditions: Epilepsy or other conditions that could be triggered by flashing visuals in VR.
* Pregnancy: As a precautionary measure for participant safety.
* Inability to Use VR Equipment: Participants who cannot wear a VR headset comfortably (e.g. due to vision impairments not corrected by glasses/contact lenses).
* Failure to Provide Consent: Anyone who does not agree to the informed consent process.

Research Questions:

* How do competitive and cooperative dynamics impact user performance in VR Exergaming?
* Does competition or cooperation lead to higher engagement and motivation compared to solo cycling?
* How do different personality types respond to competitive vs cooperative VR exergaming scenarios?
* Can AI-driven real-time adjustments improve user experience and maintain challenge levels across different fitness levels?
* What role do social interaction mechanics play in sustaining long-term engagement with VR-based fitness activities?