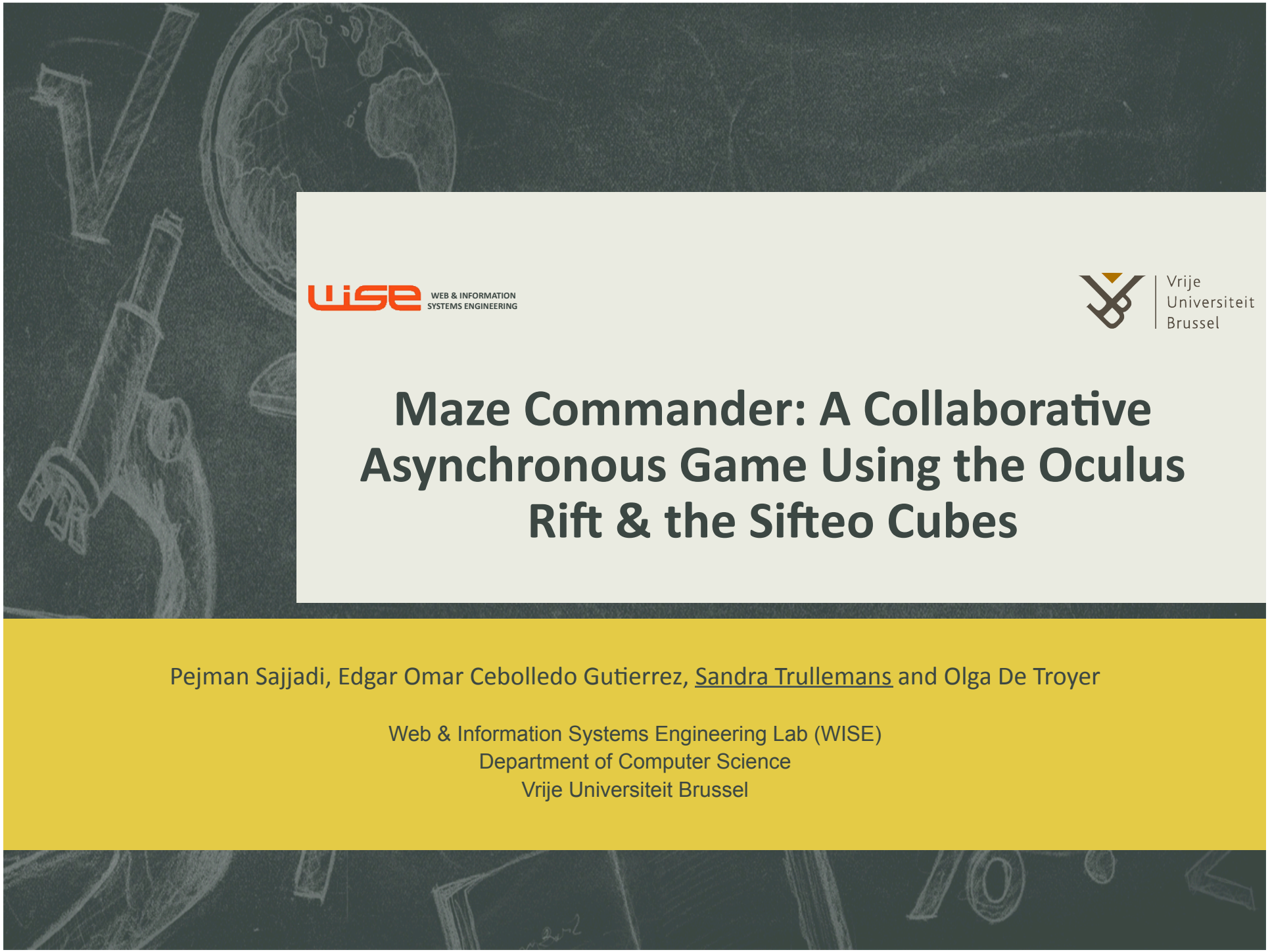

WEB & INFORMATION SYSTEMS ENGINEERING

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Maze Commander: A Collaborative Asynchronous Game Using the Oculus Rift & the Sifteo Cubes

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Adaptive Serious Games

Adaptation's Basis

- Performance
- Knowledge

Adapted Output

- Dynamic Difficulty Adjustment
- Learning Content Adjustment

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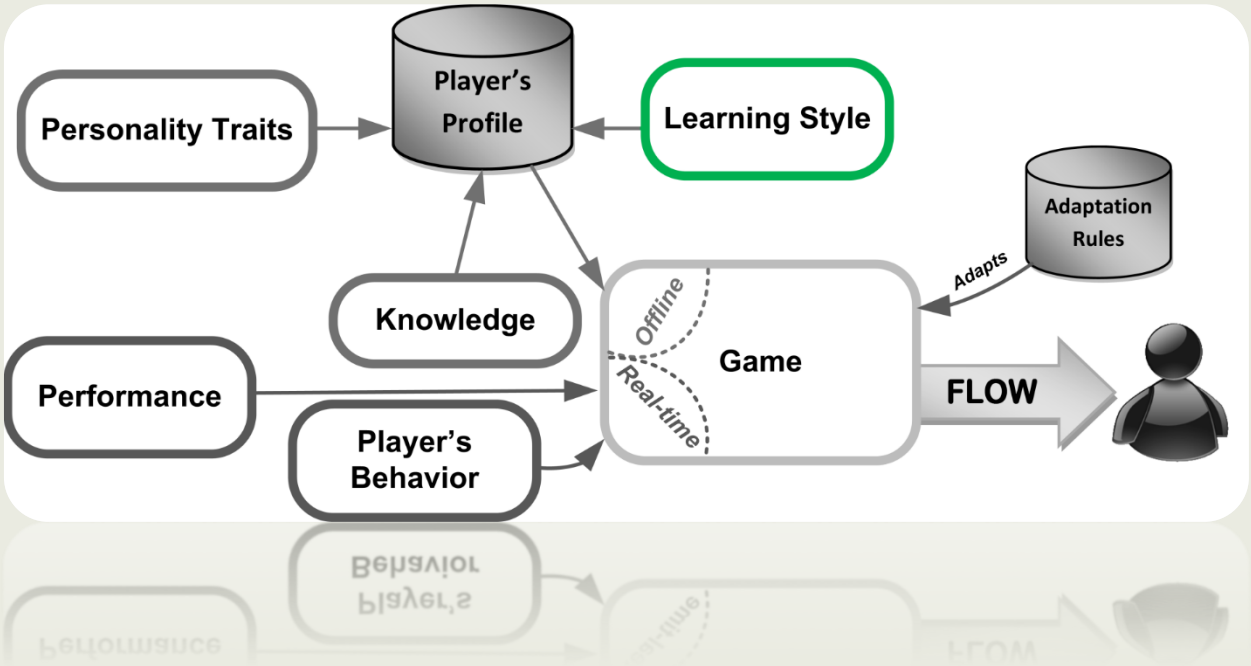
Conceptual Model - Learning Style



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Offline Adaptation Factors – Learning Style

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Research Question

- Relationship between
  - learning style
  - preferred interaction modality
- Effect on game experience and learning outcome

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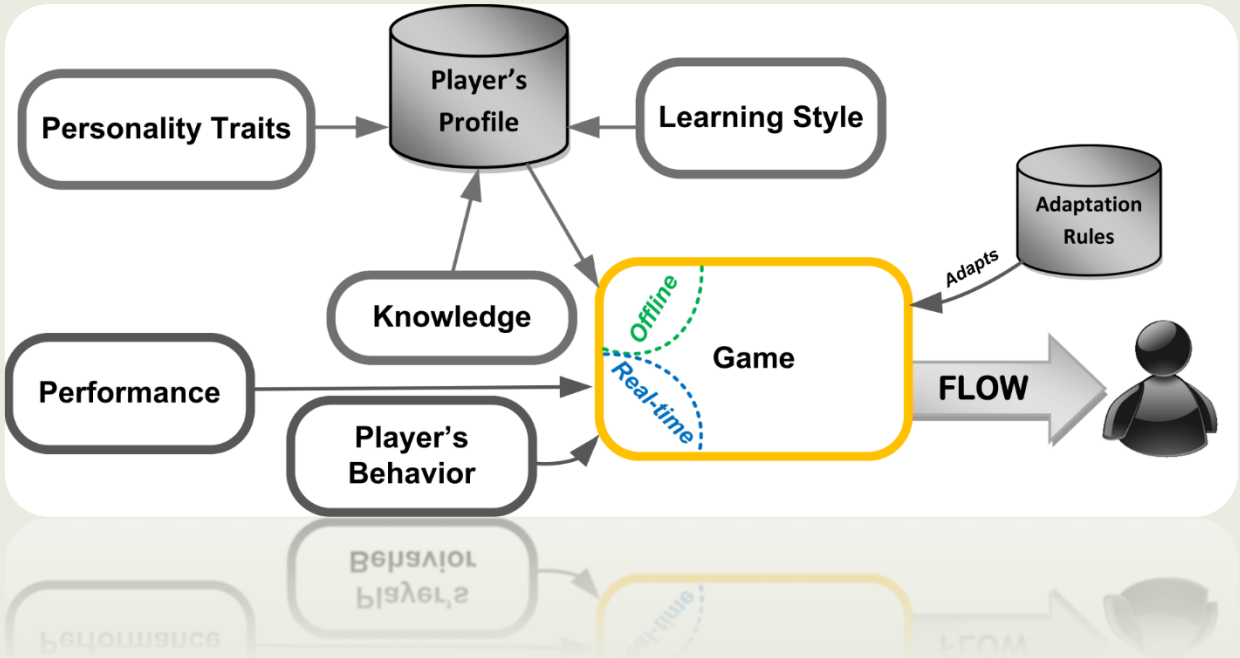
The Game



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Learning Style – Game Interaction

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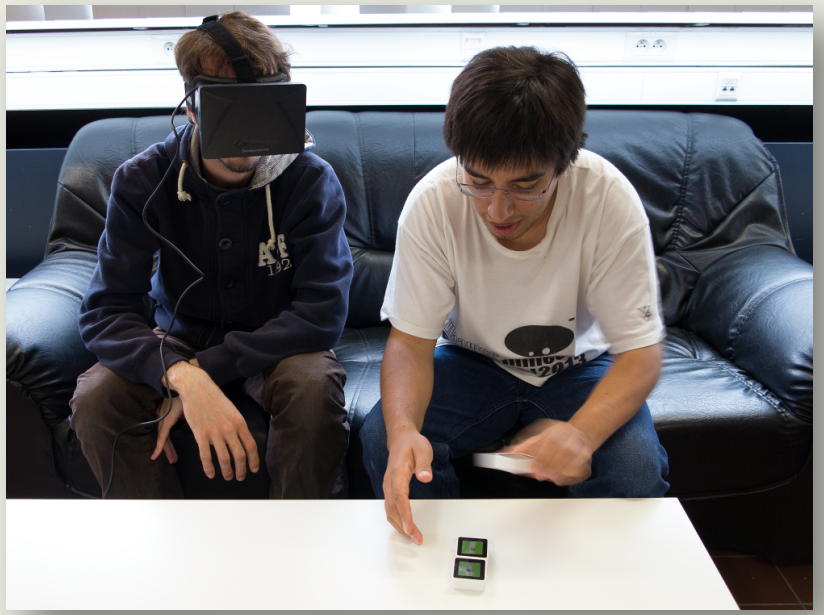
Maze Commander

- Highly Collaborative
- Oculus Rift: Visual
- Sifteo Cubes: Kinesthetic



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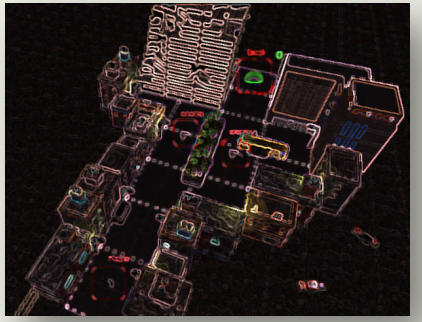
Design Principles



- **Common goal/success**
  - Escaping the maze!
- **Heterogeneous resources**
  - Oculus Rift
  - Sifteo Cubes
- **Collaborative tasks**
  - Impossible to finish the game using one player
- **Communication**
  - Different ways including verbal and physical gestures.

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Maze Commander - Visual

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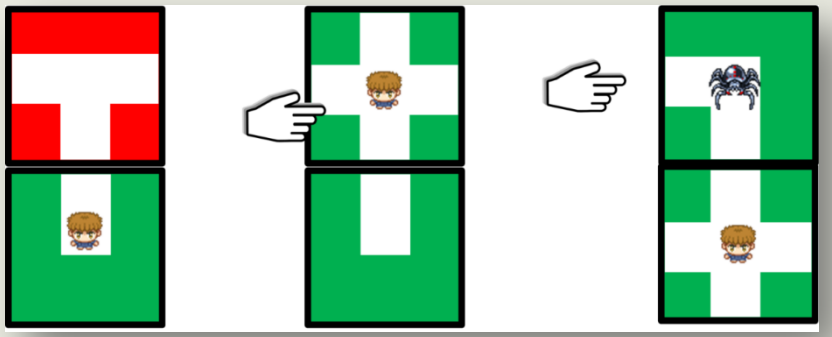
Maze Commander - Kinesthetic



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Methodology

- **Survey**
  - game experience and collaboration
- **Observation metrics**
  - collaboration and communication
- **Semi-structured interview**

- **16** participants between 19 and 36 years (av. 23.62)

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Evaluation Factors

Survey

- Competence
- Immersion
- Flow
- Tension
- Challenge
- Negative Affect
- Positive Affect
- Empathy
- Negative Feelings
- Behavioural Involvement

Observation Metrics

- Excitement together
- Worked out strategies
- Helping
- Global strategies
- Waited for each other
- Got in each other's way

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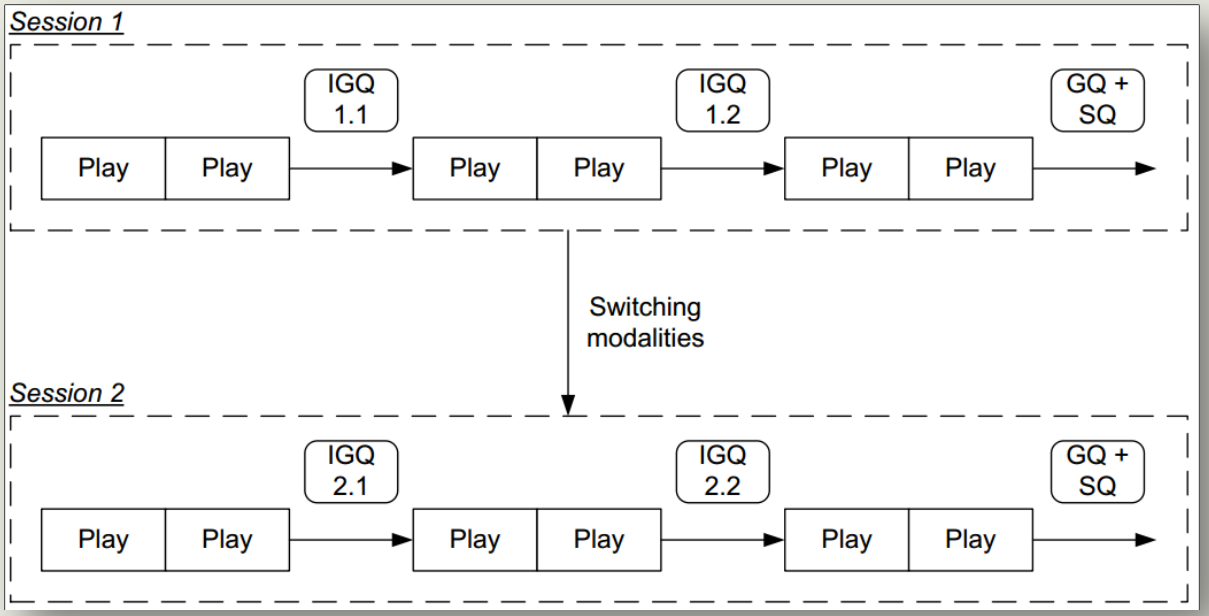
Procedure



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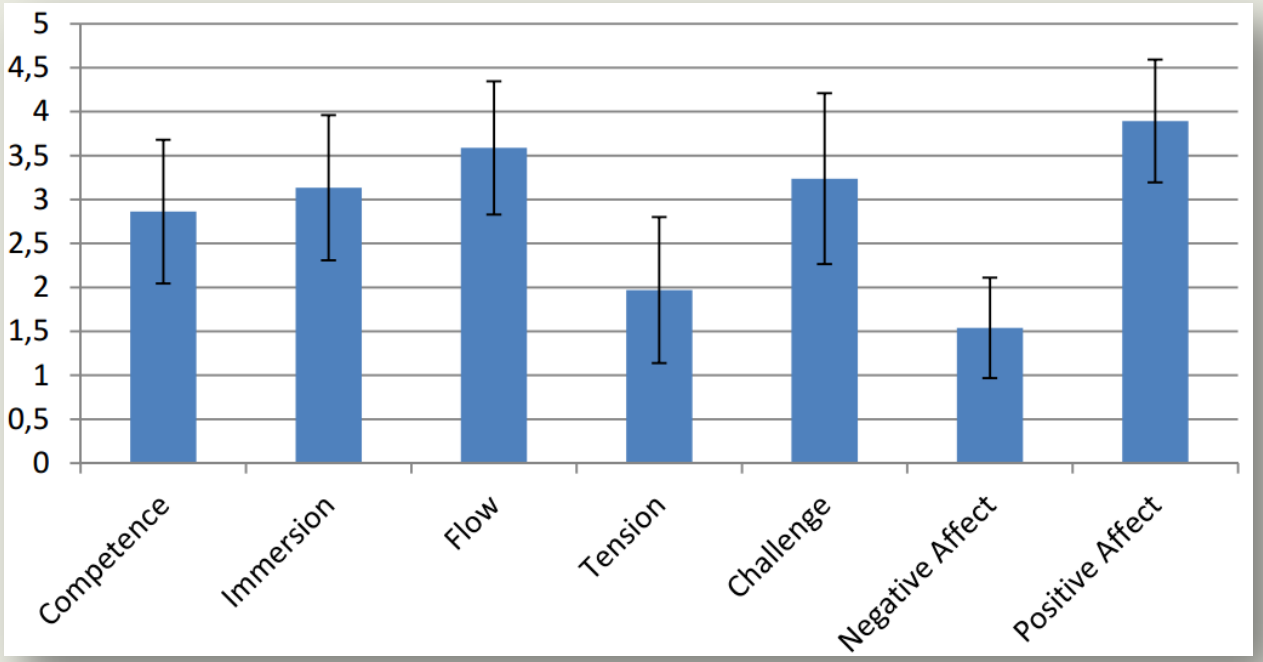
Overall Game Experience



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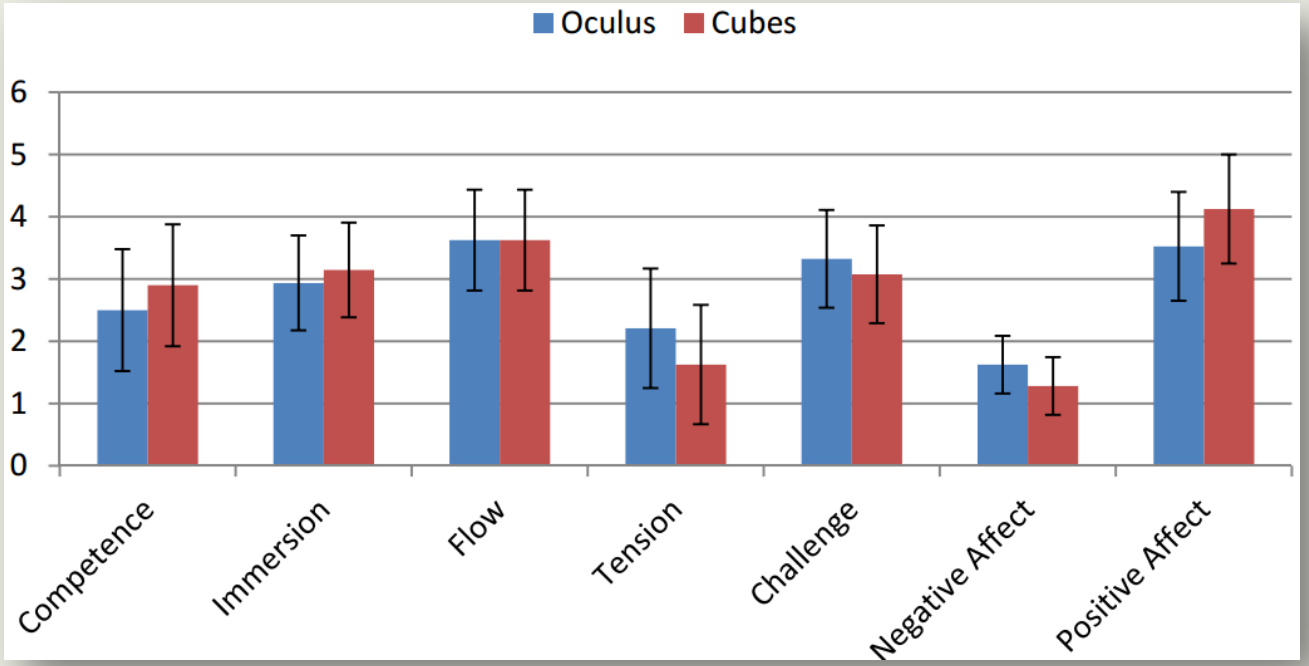
Game Experience of 1st Session



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Collaboration Observations

- Positive empathy score
- Step by step strategy
- Waiting for each other was not frustrating
- Helping was not observed
- No use of prior knowledge in second session

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Preferences

4 participants

6 participants

6 participants

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Lessons Learned

- Explicit control for the Oculus Rift
- Communication via different channels
- Importance of strategizing moments
- Skills and personality adaptations
- Interacting with the Sifteo Cubes

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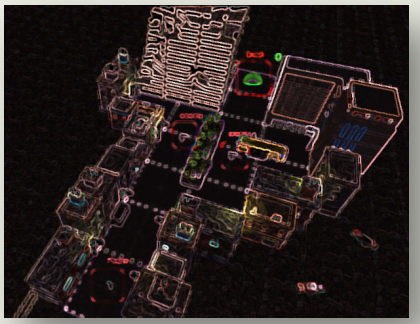
Conclusion

- Maze Commander
- Oculus Rift and Sifteo Cubes
  - Visual and kinestetic learning styles
- Good game experience
- Promising interaction modalities



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Future Work

- Improving communication
- Adaptation to learning styles
- Evaluation of influence on learning outcome

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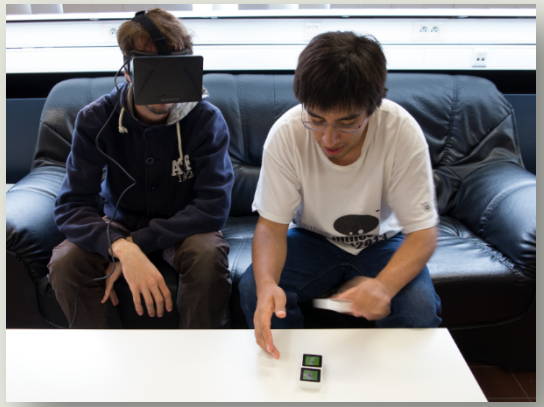
Take-Away Message

- Users communicate via various channels
- Fun and promising interaction modalities
- Sifteo Cubes “hidden” actions



- Come and play our demo tonight!
- https://www.youtube.com/watch?v=55TaHKHgFDU

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