Superhuman sports in mixed reality: the multi-player game League of Lasers

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Introduction

Playing league of lasers

League of Lasers
A superhuman sport using Motion Tracking

For that, it is playfully for short periods of time and its gameplay was designed as easy to grasp. In addition, this game stimulates players to communicate and collaborate with each other, creating strategic thinking with their own physical movement, in an attempt to outmatch their opponents’ actions and win.

League of Lasers is a game that plays as a crossing of pong and football. The main purpose is various players’ movements and the

League of Lasers

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ABSTRACT
League of Lasers is a motion-based game where two teams compete in a game between football and pong. Players use "virtual mallets", i.e., they guide a laser pointer towards the opponent team's target. The game aims at stimulating interaction between players by making cooperation a vital part of the gameplay, while having these.

League of Lasers is a game that plays as a crossing of pong and football. It

Screenshot League of Lasers

SHS Paper League of Lasers
Problem Statement

“How can mixed-reality be used to create a competitive multi-player superhuman sport?”
Problem Statement

Superhuman Sports Design Challenge

- Human Augmentation
- Fitness and Skills
- Fun and Engagement
- Audience
- Inclusiveness
Game Overview

Game design
Game Overview

League of Lasers first-person view on the HoloLens
Game Overview

Audience View

- Top down
- Server-rendered
- Projected on a wall

Top-down overview of the game for the audience
System Architecture

Network Architecture

- Unity’s UNET
  - Client: a HoloLens
  - Unity game server
- Web server
System Architecture

Localisation

- Naive method:
  - Share game positions between players
  - Doesn’t work due to position offsets
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Problem Statement
Game Overview
▷ System Architecture
User Study
Future Outlook
Conclusion

Features
Localisation
- Naive method:
- Share game positions between players
- Doesn't work due to position offsets

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System Architecture

Localisation

- Spatial Anchors:
  - Based on spatial features
  - Precise
  - Shareable
- Limitations:
  - Server does not know this concept
  - Accurate in a 3-5 meter range
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Features

Localisation

- Spatial Anchors:
  - Based on spatial features
  - Small drift
  - Precise
  - Shareable

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System Architecture

Localisation, solution:

- Use positions relative to anchors
- Relate game objects to the nearest anchor

Objects share their position relative to the nearest anchor

Lighthouse (source: Flickr)
User Study

- Tests @ TuDelft Gamelab Anniversary
- 32 Participants
- UEQ and GEQ questionnaires

Photo League of Lasers Virtual Playground event
User Study

Results

- Players praised novelty and attractiveness
- High rating on immersion, competence, positive affect and flow
- Low amount of annoyance and negative affect
- Observed lots of laughter
User Study

Discussion

- Skill-based: easy to learn, hard to master
- Fun
- Intuitive: feels like a “sport”
Conclusion

League of Lasers:
- Fulfils superhuman sports criteria
- Keeps interaction simple and focussed
- Hololens is a suitable device for superhuman sports
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