

Star Tag: a superhuman sport to promote physical activity

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Problem and motivation

- eSports is as popular as ever
- What about including physical activity?
- Why is the audience not directly involved?

Can a mixed reality game encourage active playing, as well as engage the audience to complement player's actions?



Related work

- STAR¹
 - Survival game
 - One or two players
 - Game elements give superhuman impression
- HADO²
 - Similar to dodgeball
 - Uses gadgets to motivate players to get physically active

¹Kegeleers, Marie, et al. "STAR: superhuman training in augmented reality."

²HADO USA, <https://hado-usa.com/hado>

Microsoft HoloLens

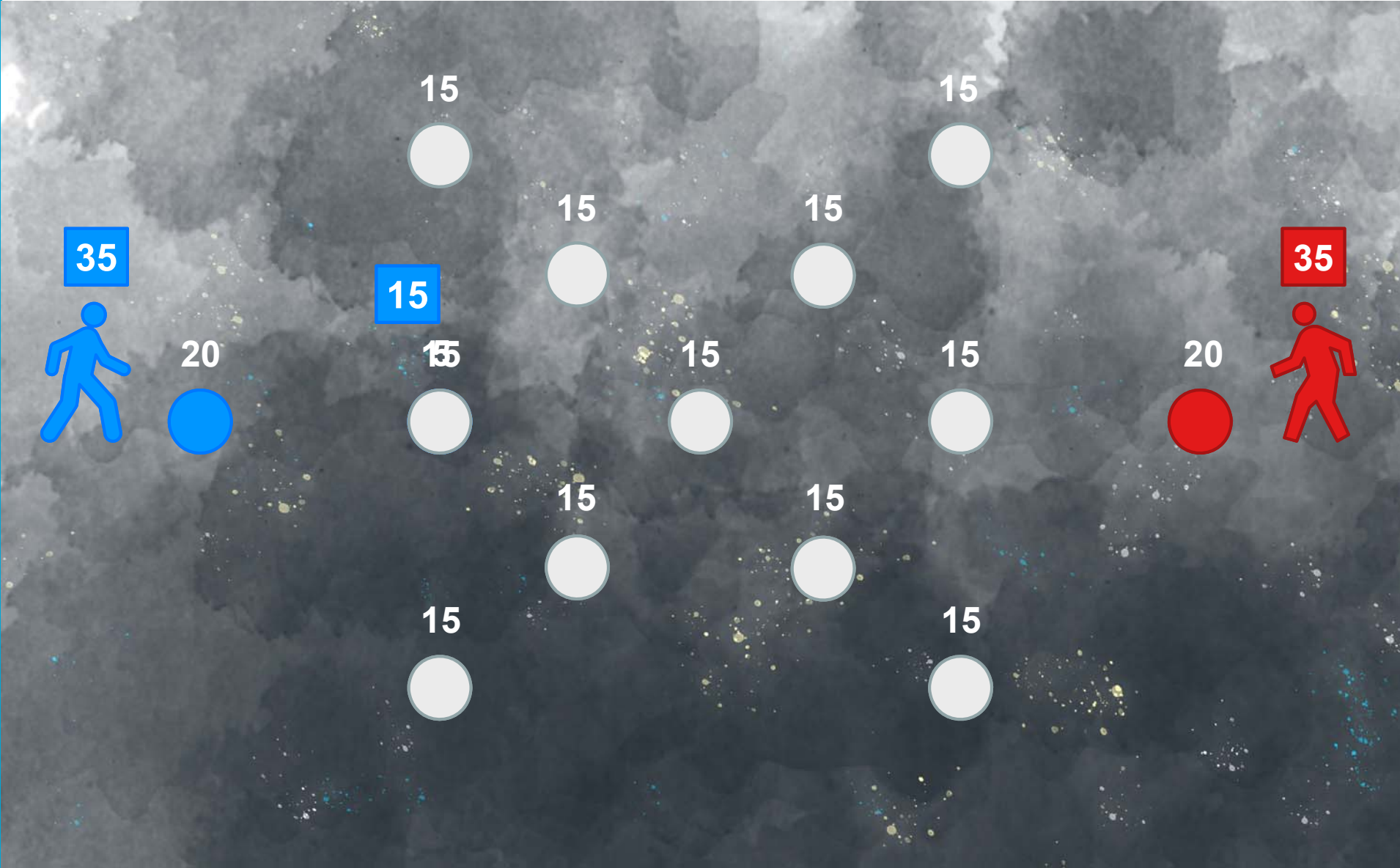
- Merges the real world with virtual augmentation
- Head-mounted unit fitted with a clear pane
- Holograms are projected on the pane
- Affords free movement



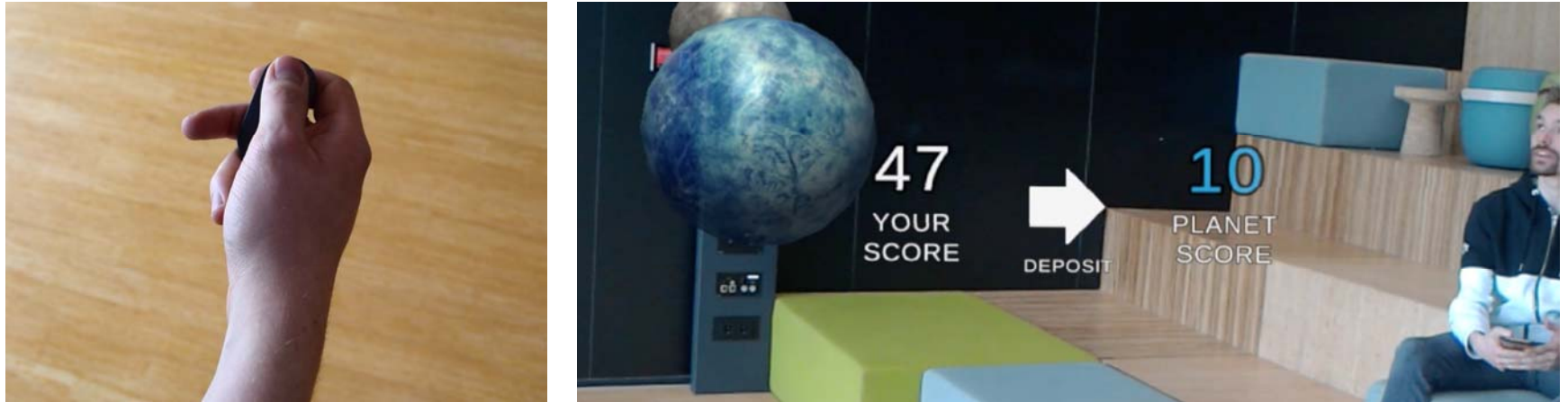
The game: Star Tag

- Competitive superhuman sport set in mixed reality space
 - Intriguing superhuman space theme
- Two players compete to conquer planets
- Developed using Unity Engine and Mixed Reality Toolkit
 - World anchors

Gameplay



Game controls



- While standing in a planet's location, players can:
 - i. Collect energy from their own planets
 - ii. Deposit energy to a planet
- Using the HoloLens clicker:
 - Click to switch modes *i* and *ii*
 - Hold to transfer energy

Audience participation

- Competition and engagement
- Progress can be followed on a large screen
- Audience is split in two teams
- Teams receive three random events to vote for
 - When the majority voted, the event is activated
 - Cool-down before next event
- Strategy and timing is key



Team 1

Please pick an event

Steal 5% of your opponent player's energy

Decrease the energy of the opponent by 10%

Add 10% of the opponent's energy to your player's energy

User study: setup

- Small-scale user test focussed on the activity and motivation of players
- Participants: 12 randomly recruited people at a university building
- Public health guidelines: encourage people to increase their step count with 3,000-4,000 steps per day
- Questionnaire on 5-point Likert-scale to measure motivation and experience

User study: results

- During the game, players take 33 steps per minute on average
- 30 minutes of playtime could make a significant contribution to taking additional steps.
- Questionnaire was filled out generally positively
 - Players felt involved and enjoyed the activity
 - Future tests: trial session

Conclusion

- In Star Tag two players compete to conquer all planets
- The audience is actively involved in the game
- Players felt involved and motivated to move around
- Even first-time players were physically active

Future work

- Analyze motivation and the impact of augmented reality on the players
- Evaluate audience participation
- Add support for more than two players with teams

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