

# Communication and Interaction Methods for Virtual Courses

## Informatics: Games Engineering Master's Thesis

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### Motivation

Due to the recent Covid-19 pandemic situation, especially educational institutions were hit hard and had to implement remote teaching procedures. These mostly included a combination of asynchronous (upload of worksheets, on-demand lectures, forums) and synchronous communication (video conferencing with Zoom, Skype, etc.). However, online education has several issues such as lack of personality expression, lack of communication and social interaction or Zoom fatigue.

There are a lot of rather recent applications on the market that try to improve our way of online communication which are fit for educational, work or social settings. They heavily incorporate avatar usage as representation of users and a world that defines traversable spaces like Gather.town, Wonder.me or Mozilla Hubs, which you are using right now! These allow for more natural interactions which are automatically initiated once users get close enough to one another. This concept of *proximity* is what the Master's Thesis is based and which an entire online virtual world prototype is built on!

### Overview

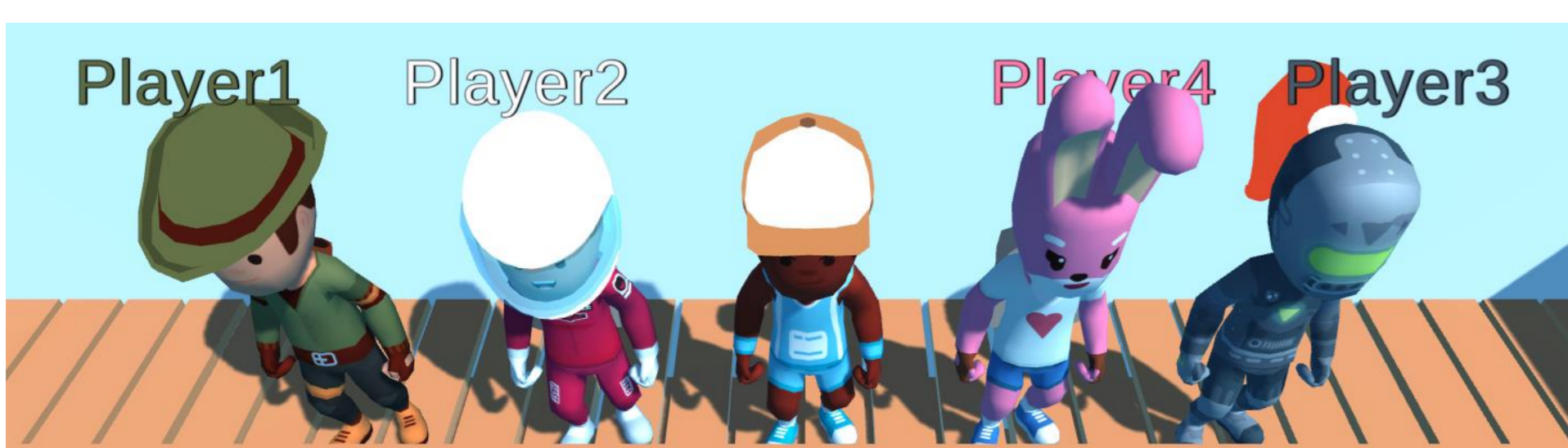
- Built with Unity3D
- Mirror Networking (Online!)
- Host-client structure
- Mumble open-source voice chat, internal text-chat + emojis
- All open-source assets



Offline scene in which you start your game, change you clothing and join the campus!

### Environment Design

Important conversations between students before and after class are non-existent in video conferences. When the stream ends, all listeners are kicked out. Thus, the game environment imitates a school campus and offers various spaces that serve different purposes in which students can gather even when class is not taking place. Therefore, the space had to be designed in a way to bring together people with similar intentions and ease navigation and probability of productive interactions. It offers a lecture hall, community room, study rooms, library, gathering plaza, etc.



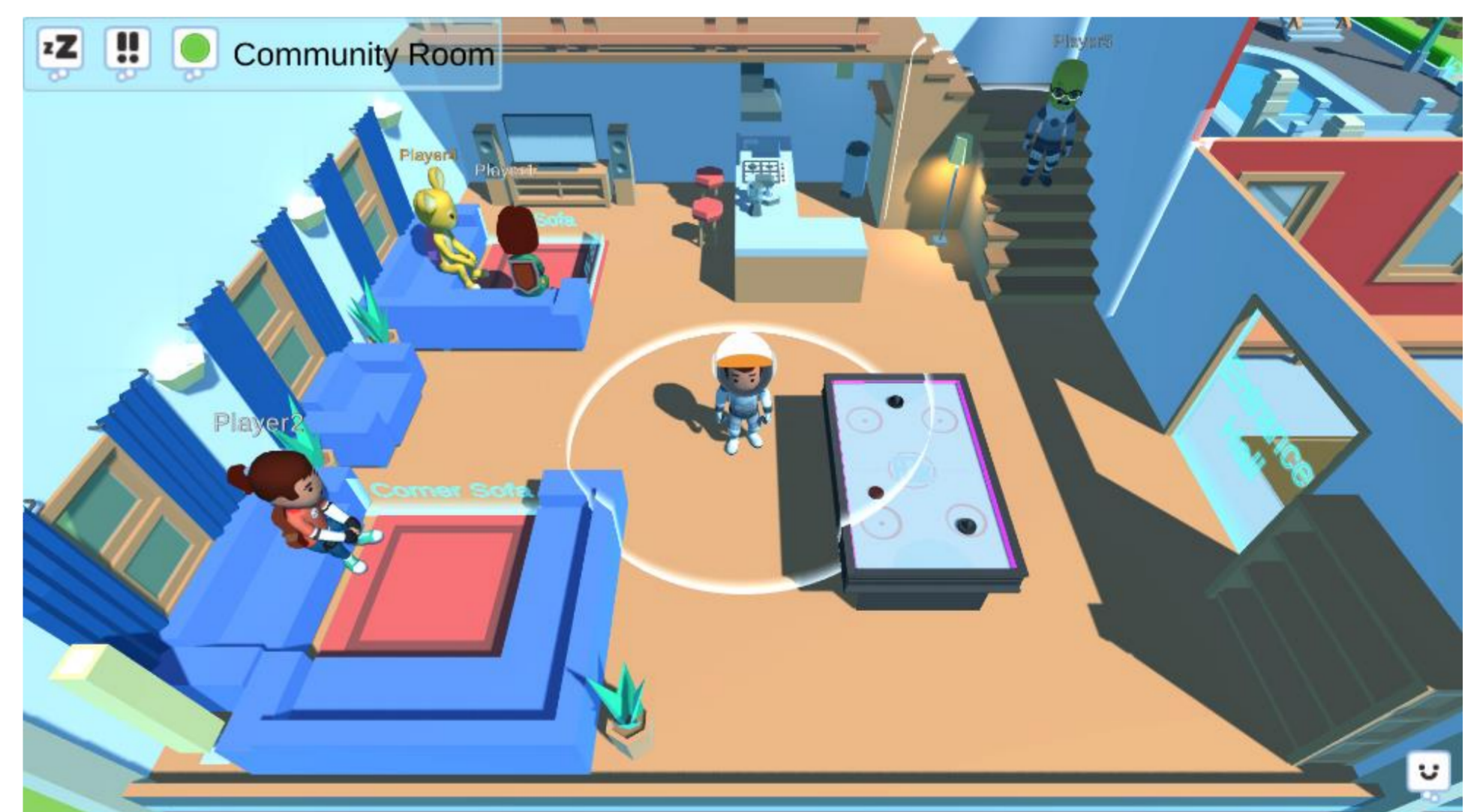
### Safety First – Proximity and Personal Space

Proximity usually describes the closeness and cohesiveness of work groups. In game, it is indicated by a circle around every player. This is the border that players need to cross in order to start communication. Two players can only talk via text or voice chat when they are in each other's circle. This system allows players to have private conversations while also noticing that other players are conversing as well. This can enhance the social presence felt by players as they recognize the existence and actions of others around. This also offers means of bundling players in groups and spatially orienting them as they have to approach each other in order to interact.



At the main plaza players are talking which is only possible if they share their proximity.

Moreover, due to strong embodiment in one's character, infringement of one's personal space can cause discomfort, disturbance of immersion or even more harm in case of cyberbullying or sexual harassment. In order to prevent characters from clipping, other avatar models become translucent when in contact. Thus, the player always keeps overview and might be less likely to be disturbed by visual intersections.



The community room is one of the spaces where players can relax and socialize together.

### Summary and Outlook

The creation of identity with one's character is vital for feeling present in the world while it also emphasizes community and equality. The campus app facilitates encounters and communication in a safe way online and provides prospects for more social environments. It would further benefit from themed maps or avatars, inclusion of meaningful interactions such as integration of a learning management system, or more gamified features. A future study in connection with a university course is advised.