

VRTP: Virtual Reality Tutoring Platform

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Abstract

The project addresses one question, how do we move forward in online education? Presently, online classes are offered by schools, universities and other academies, becoming the main source of education. As online education scales up in activity, with no quality improvements, we notice the various limitations and how we have hit a wall. There is no more for us to do, as developers and engineers, in order to make online education have a real step forward. That is why a new technology is needed.

Introduction

A multitude of institutions are becoming the main source of education due to Covid-19 and a new shift and view on online learning. This shift illustrated the limitations of communication through flat screens. Professors and tutors found themselves limited as they were presented as a 2D image to their students, unable to make demonstrations, or have engaging sessions. A new system is needed to change the dynamics of how classes are presented online in order to catch the attention of students, keep them active, and offer them the best learning experience. As online education scales up in activity, with no quality improvements, we notice the various limitations and how we have hit a wall.

Unfortunately, the present online technology has little room to grow. That is why a new technology is needed. The Oculus Quest 2 offers technologies that will help the development of online education: 6DoF, hand tracking and lip sync will allow the users to have meaningful physical interaction, while also feeling each other's presence as if they were sitting in the same room.



Methods | Design | Analysis

Implemented a unique algorithm to mimic VR Physics and VR hands, making grabbing objects seamless and realistic as hands automatically blend themselves around grabbed objects.

- Improved networked structure for a VR learning platform.
- Various environments prepared for tutoring students.

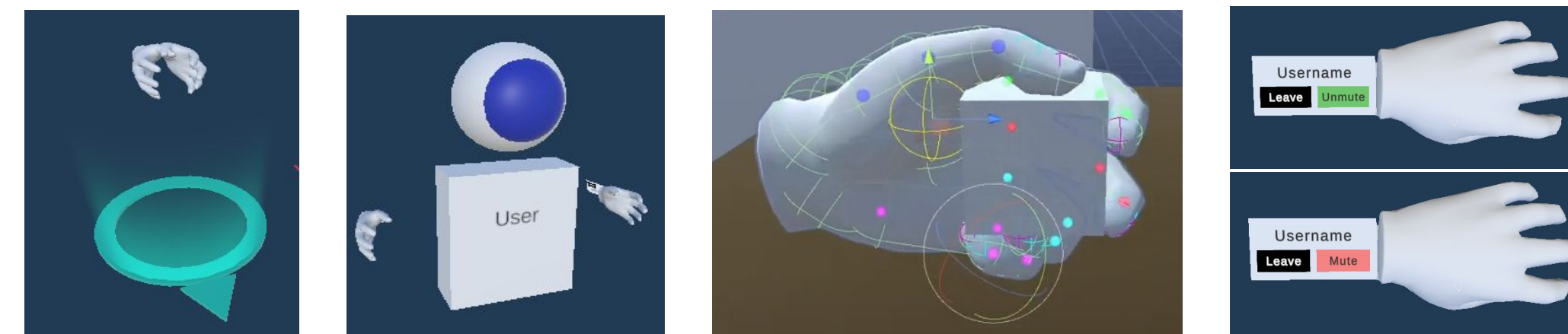


Figure 1 VR Controller Figure 2 Avatar Design Figure 3 Realistic Physics Figure 4 Audio Control Design

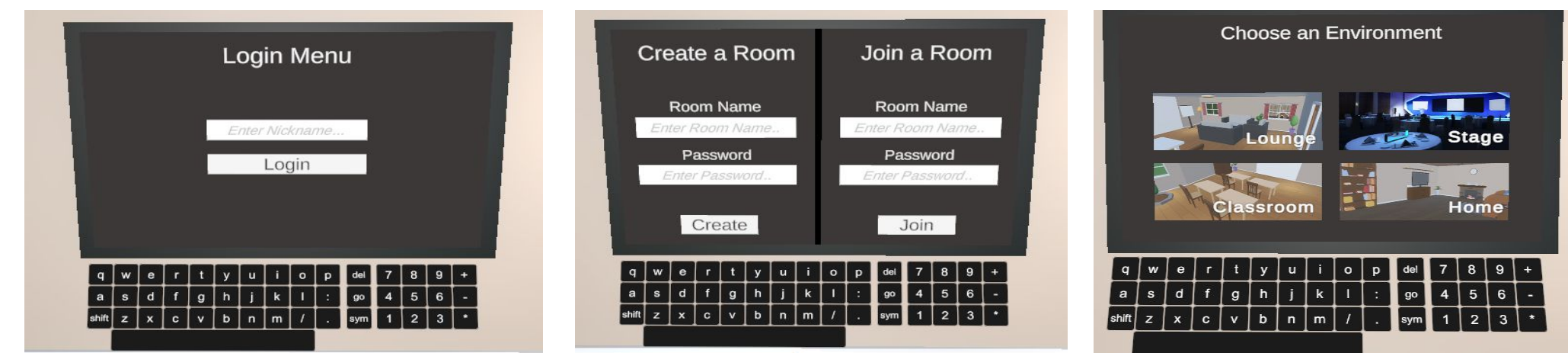


Figure 5 UI: Login Menu Figure 6 UI: Room Creation/Join Menu Figure 7 UI: Environment Choice Menu

Results

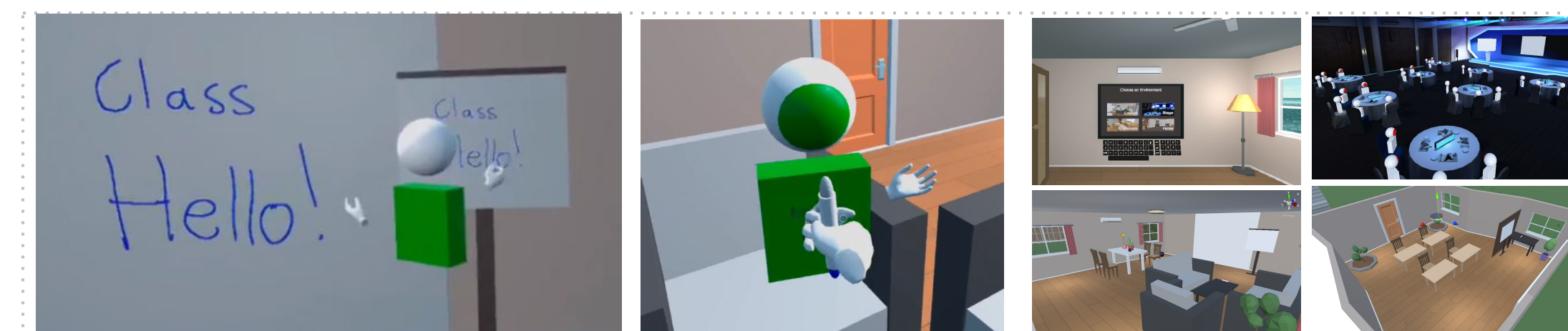


Figure 8 Networked White Board Perception View Figure 9 Networked Grabbles Figure 10 Home Room (1 of 5 Environments)

Conclusion

Moving the online educational platform to Virtual Reality will bring huge benefits and give us new tools we didn't think are possible to have online. With the right tools and environments, it may even be more beneficial and interactive than in-person classes.

- Bringing physical interactions back to online platforms
- Giving teachers more tools

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References

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