



Immersive Realities Working Group

A Human Touch of Immersive Technologies:

Exploring real-world applications

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A Human Touch of Immersive Technologies: Exploring real-world applications

At a point in time where technology continues to redefine the boundaries of human experience faster than ever, immersive technologies stand out as tools for profound transformation. They revolutionize areas like entertainment and gaming, and have transcended into realms that can deeply influence our day-to-day life and well-being, such as healthcare, education and learning.

On February 1st 2024, the TUM Think Tank in collaboration with the World Economic Forum Global Shapers hosted the "Thursday Mixer - Practical Application of Immersive Realities" which offered the opportunity for participants to explore and interact with a range of immersive applications brought forth by Brainjo, Stelldirvor and XRHubBavaria.

To better understand the way users interact with immersive technology, our discussions revolved around the immersive experiences' added value and user wellbeing, while also registering their immediate perceptions about the experiences.

Participating Organizations:

Brainjo

Brainjo is in the process of becoming a certified Digital Health Application (DHA), intending to contribute to ADHD treatment for children and young people through VR experiences that complement the therapeutic process and represent a treatment alternative to the use of medication from an early age.

Stelldirvor

Stelldirvor's goal is to make healthcare better through the use of Immersive technologies, helping medical facilities relieve employees in everyday life, pass on knowledge, and allow learning through new experiences safely while also preparing for high-stress contexts and emergencies.

XRHubBavaria

XRHubBavaria aims to foster a strong and lively XR community, with people who exchange ideas and realize innovative XR projects together through a free and independent platform. Their XR Network is the central digital community hub for the XR ecosystem in Bavaria.

Insights from the demos and discussions

"I found the wide variety of possible applications particularly exciting: from games such as table tennis to medical applications for therapeutic support with AD(H)D to training for nursing staff, everything was on offer." – Felix Rank

Participant's experiences

During the event, participants tried the applications using different VR and AR headsets, registering their experiences immediately after. The physiological reactions varied with the applications, from a higher heart rate to a general sense of relaxation. However, the emotional reactions were very similar across applications: most users reported feeling joy or excitement, or a combination of the two.

Participants expressed their positive views on the technology after experiencing it, finding the applications useful and potentially beneficial for their own lives.

Immersive value

A discussion about the value-add of immersive technologies compared to traditional experiences is fundamental when navigating the digital evolution, we want to explore how these innovations can benefit our daily lives. Immersive technologies like Virtual Reality

(VR), Augmented Reality (AR) and Mixed Reality (MR) promise an unprecedented level of engagement and interactivity beyond the passive consumption of content, by allowing users to step inside a virtual world or overlay digital information onto the physical world. In plenty of scenarios there is a fundamental value in the immersive components as experienced firsthand at the Thursday Mixer.

Brainjo's proposal of VR for alternative AD(H)D cognitive neurofeedback therapy, leverages immersiveness and provides a unique and scalable application that would not be the same in 2-D. Brainjo combines this with an EEG headband to track concentration of the users and a gamified design to make the experience attractive and engaging to children. The headsets limit external incentives and allow for a controlled activity.

Stelldirvor's medical training application highlighted one fundamental plus of VR experiences: they require one single space. Indeed, with the need of one single room to be transformed into all the different scenarios students need to prepare for, both individually and in teams, the virtual space can go from an ambulance to an operating room or a recovery room with visitors in minimal time and with no additional resource use. Students and professionals can engage in multiple levels of challenges that mirror real life with time constraints, other individuals present and discomfort manifestations from the virtual patients.

XRHubBavaria's VR showcases multiple applications created by a network of users with many different goals, from entertainment to learning and practicing soft skills. In this context each user is able to create a virtual scenario according to their own particular needs and share it with others.

The immersive experiences made participants emphatic towards situations outside their regular experiences, for example, two consultants were exploring the training application for nurses, and were stunned by the complexity of the situation and the number of decisions to be made. This demonstrated the **potential of an application** like this, both for **training purposes** and for **increasing awareness**. This use of the technology creates opportunities, not only for consultants for the healthcare sector but also for policymakers to immerse themselves and step into the role of a person in the healthcare sector when making decisions affecting these professionals.

Mental Health and user wellbeing

As immersive applications and experiences become increasingly integrated into our daily lives it becomes vital to consider their implications on our wellbeing. As was previously described, immersive tech can hold vast potential for therapeutic applications, safe exposure and skill practice. However, the immersive nature of these technologies also raises ethical questions about their impact on cognitive and emotional well-being and the user's mental health. This event showcased how technology development has a focus on these pressing issues and moves towards solving them across different areas, without losing touch with the need for a humans-in-the-loop when referring to Digital Health Applications.

The TUM Think Tank as a collaboration platform

The TUM Think Tank provides multiple opportunities and scenarios for the TUM community to harness and cultivate collaboration between academic research and the private sector to foster responsible innovation, revitalizing the role of the university in times of crisis, and highlighting how both students and researchers can contribute to public interest technology. Questions such as how to operationalize coherent and practical research and how this can be translated to the market can be channeled through this public-private collaboration. TUM's spirit has always promoted innovation driven through talent, excellence, and responsibility, and spaces such as the TUM Think Tank Mixer embody them.

Collaboration with the World Economic Forum Global Shapers Munich Hub

The "Thursday Mixer - Practical Application of Immersive Realities" was organized in collaboration with the WEF Global Shapers community. They commented:

"We as volunteers at Global Shapers Munich are immensely happy to see our cooperation with TUM Think Tank prosper, where our mission is to move from theory to practice to jointly define and build 'the Metaverse'. Our platform unites stakeholders from various sectors, from academia, business, and civil society to government. Our joint event 'Immersive Reality Chronicles: Applications of Immersive Reality' was another fruitful step in bringing XR experiences closer to our ecosystems." - Markus Kirchschlager

Continuing the discussion

This Thursday Mixer offered the opportunity to jointly explore and discuss new immersive experiences and their concrete application in areas of our daily lives. This presents multiple research avenues for the future. We invite everyone to continue the discussion. Follow our work on the website, join our events at the TUM Think Tank, or become part of the Immersive Realities Working Group.

As we have once again demonstrated: the best insights come from bringing diverse perspectives together. Whether you are a researcher, student, innovator, or technology enthusiast – your voice matters!

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