Editorial: Everyday Virtual and Augmented Reality: Methods and Applications, Volume II

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Editorial on the Research Topic
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1 Introduction

VR and AR technologies are on their way into our everyday life. They are entering public transit (Schmelter and Hildebrand, 2020), offices (Zielasko, 2020), training (Clifford et al., 2019), and education (Borst et al., 2018), to name a few. While much of the knowledge gained in the last 5 decades of research in these fields apply to the use in people's daily lives, there are also new contexts, questions, and challenges. As a continuation of the first volume (Borst et al., 2021), this Frontiers Research Topic presents articles that give answers and solutions to those technologies.

Two articles in this volume deal with places of daily life, which are team meetings and museums. Two other articles are concerned with accessibility, namely, cybersickness and accessibility guidelines for VR gaming.

2 Places of daily life

In their field study, Bonfert et al., investigate the differences between off-the-shelf VR social platforms *versus* videoconferencing for the purpose of weekly virtual team meetings over a period of 4 months. The authors assessed key measures such as social interaction, productivity, and individual experiences. They find that VR solutions work and can even offer advantages, especially when socializing around a meeting but, overall, still suffer from many problems of the nascent technology. This includes challenges such as missing or only sparsely available (facial) expressions and gestures or status awareness of spatial sound, which should be solved technologically in the next few years. There are also supposedly

intrinsic problems such as an increased technical effort. However, the authors also conclude that established behaviors and processes do not necessarily get the best out of social VR platforms and that new opportunities exist for interaction with these technologies.

With their AR nuggets, Rau et al. develop reusable building blocks that are accessible to non-developers through the unity game engine and allow users to create non-linear, location-based content. Their building blocks abstract five different patterns that are common in AR applications for museums: superimposition, object transparency, exploded views, sequential explanation, and, a little bit less general, the visualization of sonar waves for the explanation of echolocation in natural history. They demonstrate the applicability of their toolkit with domain experts of a history exhibition in the Senckenberg Museum in Germany.

3 Accessibility

VR can be used in many places to create inclusion, but the technology itself is not yet accessible to everyone. Cybersickness is one of the biggest inhibitors to the widespread adoption of VR technology. Effective research on the reasoning and mitigation of this phenomenon requires a reliable measurement of the symptoms. In the absence of reliable and easy-to-use objective measurement options, the standardized Simulator Sickness Questionnaire (Kennedy et al., 1993) is still the most widely used measurement tool. Using the SSQ to obtain a control measurement prior to the experiment is controversial as subjects could be manipulated by increased attention to their wellbeing or by divining a working hypothesis. However, Brown et al. in their study show that the assumption that healthy participants automatically enter an experiment with minimal or no symptoms seems to be incorrect. Lastly, the authors encourage research into alternative methods of measurement

as (medical) self-reports are prone to inconsistency and are also known to be difficult to perform for a layman (c.f. Zielasko (2021)).

Heilemann et al. carried out an informal literature search on guidelines for accessibility and inclusion in the context of video gaming and VR applications. On the data, they form an uncommented union of all rules, which can serve as a starting point for a more comprehensive and widely acknowledged set of rules as their analysis reveals that none of the existing standards and guidelines are complete.

Author contributions

DZ drafted this editorial with suggestions and approval from CB, SJ, and AD.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Borst, C. W., Lipari, N. G., and Woodworth, J. W. (2018). "Teacher-guided educational VR: Assessment of live and prerecorded teachers guiding virtual field trips," in Proc. of IEEE Conference on Virtual Reality and 3D User Interfaces, 467–474. doi:10.1109/VR.2018.8448286

Borst, C. W., Weyers, B., Simeone, A. L., Dey, A., and Zielasko, D. (2021). Editorial: Everyday virtual and augmented reality: Methods and applications. *Front. Virtual Real.* 2. doi:10.3389/frvir.2021.760883

Clifford, R. M., Jung, S., Hoermann, S., Billinghurst, M., and Lindeman, R. W. (2019). "Creating a stressful decision making environment for aerial firefighter training in virtual reality," in Proc. of IEEE Conference on Virtual Reality and 3D User Interfaces, 181–189. doi:10.1109/VR.2019.8797889

Kennedy, R. S., Lane, N. E., Berbaum, K. S., and Lilienthal, M. G. (1993). Simulator sickness Questionnaire: An enhanced method for quantifying simulator sickness. *Int. J. Aviat. Psychol.* 3, 203–220. doi:10.1207/s15327108ijap0303_3

Schmelter, T., and Hildebrand, K. (2020). "Analysis of interaction spaces for VR in public transport systems," in Proc. of IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops, 279–280. doi:10.1109/VRW50115.2020.00058

Zielasko, D. (2020). *DeskVR: Seamless integration of virtual reality into desk-based data analysis workflows.* Ph.D. thesis. Aachen, Germany: RWTH Aachen Univeristy. doi:10.18154/RWTH-2020-02929

Zielasko, D. (2021). "Subject 001 - a detailed self-report of virtual reality induced sickness," in Proc. of IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops, 165–168. doi:10.1109/VRW52623.2021.00038