CFP

The workshop title and acronym: Enhancing User Comfort, Health and Safety in VR and AR
(EUCHS ARVR)
Expected workshop date(s): March 26, 2023
Whether the workshop is organized online or on-site (at the conference): Online
The workshop website: To be determined

A brief overview and description of the workshop

As Augmented Reality (AR) and Virtual Reality (VR) are being more widely used in the home and workplace, user comfort, health, and safety are becoming increasingly important. Users need to be able to have confidence in AR/VR devices and content, and that they are comfortable and safe to use for long periods of time. Comfort concerns can lead users to avoid or prematurely decline to use AR/VR, even if the concerns are readily addressed or corrected. For example, in VR, some degree of visually induced motion sickness (VIMS) is reported by 30-40% of users [1], and these effects can last for several hours after the VR experience [2]. In outdoor mobile AR applications, AR content might distract people from real-world dangers [3].
Costello [4] identifies health and safety concerns associated with VR divided into physical, physiological, and psychological factors. Similarly, there could be health concerns associated with AR, such as eye strain associated with the vergence-accommodation conflict in optical see-through AR systems [5].
Comfort, health, and safety concerns for AR and VR can be quite different. For example, VIMS could be more common in VR. However, AR may be used anywhere, with potential physical hazards or dynamic events in the surroundings unexpected to the users or unknown to application designers.
There are also important issues that should be considered for specific sectors of the population, such as children, elderly, or people with disabilities or for specific professionals such as industrial workers or medical professionals. For example, Yamada-Rice et al. [6] identify unique health and safety concerns for younger ages of population.
Despite the notion that comfort, health, and safety are important issues for use of AR and VR, there have been relatively few venues to present research in the field. This workshop will provide an opportunity for academic and industry researchers to present their latest work, and research in the process. It will also host a discussion identifying important research topics in comfort, health, and safety.
The workshop will consist of three sections. First will be two invited talks regarding recent developments or challenges. Second section will be rapid fire talks consisting of presentations based on the submissions. Final session will be devoted to a discussion of the important research issues in comfort, health and safety with the goal of producing a substantial review summarizing grand challenges that need to be addressed. Participants will first divide into breakout rooms to conduct a World Cafe style session to ideate and distill the key challenges and potential paths to research solutions on the topics that have been identified in previous workshops.
The outcome of the workshop will be to identify a research roadmap for reducing and addressing associated comfort, health and safety issues. This roadmap will be summarized on a website and journal special issue associated with the workshop. In addition, a joint position paper arising out of the workshop discussions (as well as prior ones) will be submitted for publication.

References

[1] Johnson, D. M. (2007). Simulator sickness research summary. ARMY RESEARCH INST FOR THE BEHAVIORAL AND SOCIAL SCIENCES FORT RUCKER AL.

[2] Szpak, A., Michalski, S. C., Saredakis, D., Chen, C. S., & Loetscher, T. (2019). Beyond feeling sick: the visual and cognitive aftereffects of virtual reality. IEEE Access, 7, 130883-130892.

[3] Barbieri, S., Vettore, G., Pietrantonio, V., Snenghi, R., Tredese, A., Bergamini, M., ... & Feltracco, P. (2017). Pedestrian inattention blindness while playing Pokémon Go as an emerging health-risk behavior: a case report. Journal of medical internet research, 19(4), e86.

[4] Costello, Patrick J. "Health and safety issues associated with virtual reality: a review of current literature." (1997): 371-375.

[5] Marklin Jr, R. W., Toll, A. M., Bauman, E. H., Simmins, J. J., LaDisa Jr, J. F., & Cooper, R. (2020). Do Head-Mounted Augmented Reality Devices Affect Muscle Activity and Eye Strain of Utility Workers Who Do Procedural Work? Studies of Operators and Manhole Workers. Human Factors, 0018720820943710.

[6] Yamada-Rice, D., Mushtaq, F., Woodgate, A., Bosmans, D., Douthwaite, A., Douthwaite, I., ... & Whitley, S. (2017). Children and virtual reality: Emerging possibilities and challenges.

A list of the workshop's topics

The workshop will cover a range of different topics such as:
- Methods for identifying health and safety issues in AR/VR
- Important research topics in health and safety
- Empirical studies on simulator sickness, eye strain, or other negative impacts of AR/VR technology
- Techniques for mitigating unseen hazards in XR (e.g. redirected walking), or enabling awareness of the user's surroundings (e.g. guardian systems, augmented virtuality)
- Studies on psychological and physiological implications of AR/VR technology use
- Novel approaches for limiting distraction or drawing attention hazards during AR usage
- Evaluation methods for measuring effects on health and safety

The workshop's format and submission guidelines:

The paper must be written in English. The submission must be in the form of a two-page summary paper (references included) with a maximum of 100-word abstract. The submitted paper must be in PDF format with embedded fonts. Two-page papers will be included in the abstracts and workshop proceedings and will be archived in the IEEE Digital Library, and therefore must be formatted using the IEEE Computer Society format described at http://junctionpublishing.org/vgtc/Tasks/camera.html.Papers must be submitted through workshop online submission site - TBD. Supplemental materials, such as a video or image, can be uploaded to the submission site as well, but are not mandatory. Every submission should be anonymous for a peer-review process.

A list of the workshop organizers, including their affiliations and how to contact them

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