 XR

Extended Reality

and Vision Science

Extended Reality (XR) is a term used to describe the full spectrum of combinations of our natural view of the real world and digitally created worlds. It includes both Virtual Reality (VR) and Augmented Reality (AR). The promise of XR has captured the attention of many scientists, engineers, potential users, and also many large and small technology companies. As a result, enormous creative energy and resources are being devoted to realizing the full potential of XR. In the process, the search for effective technologies and compelling experiences has highlighted the importance of human vision to the XR endeavor. Topics that are critical to XR design are visual optics, vergence, accommodation, binocular vision, depth perception, color vision, spatial and temporal contrast sensitivity, visual resolution, motion perception, contrast and lightness perception, and many, many more. For basic vision scientists, XR also provides an exciting opportunity to bridge the gap between vision in the laboratory and vision in the real world. The integral role of vision science in advancing XR, and in turn using it to advance scientific inquiry, has helped generate a renewed synergy between basic and applied science.

The goal of this special issue is to provide a forum for publication of high quality research or reviews in this area. Among the potential topics are:

- Vision science considerations in design of XR
- Vision science based metrics of image quality in XR
- Effects of XR on visual performance and comfort
- XR as a tool to study human vision
- XR as a tool for clinical evaluation of visual function
- XR as a treatment modality for vision disorders
- Effects of XR on myopia and other clinical conditions
- Multi-sensory input in XR
- Perception-action coupling in XR

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