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Challenges and New Trends in Rendering for Virtual and Augmented Reality

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Message from the Guest Editors

Dear Colleagues,

With the larger and larger spread of virtual reality (VR) and augmented reality (AR) technology in recent years, new requirements for better rendering, visualization, immersion, and interaction have been expected by different fields adopting the technology. As fields such as architecture, advertising, industrial inspection, education, medicine and film and game development continue to develop the potential of these technologies, new opportunities for advancement and potential problems have arisen. How can we achieve more realistic shadows and illumination in AR application both indoor and outdoor? How can we better introduce HDR rendering to VR application to better simulate how the human eye reacts to light changes? What is required to bring a more seamless walking and interaction experience to VR, to both novice and experienced users? Where is the balance between creating beautiful and immersive AR and VR environments and managing visual and cognitive clutter for the users?

The aim of this Special Issue is to provide an outlet for interesting and novel studies in VR and AR, that tackle problems and new opportunities within rendering, visualization and immersion. We welcome new and exciting research into existing issues, benchmarks and overviews of the state-of-the-art, as well as insights into new possibilities for utilizing VR and AR in different fields. Topics of interest include, but are not limited to, the following:

- Shadow and lighting rendering in VR and AR
- Visualization of large-scale objects in AR
- Rendering of subterranean, inside and hidden object features in AR
- Big data visualization, analytics and interaction in VR and AR
- Perception of scale, spaces and motion in VR and AR
- Rendering techniques for optimization, user guidance and higher fidelity visualization in VR
- Computer graphics and display technologies for VR and AR
- Computer vision, deep learning and AI for VR and AR
- Multimodal interaction in VR and AR

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