



Wang Lili is a professor and doctoral supervisor at the School of Computer Science, Beihang University, deputy director of the State Key Laboratory of Virtual Reality Technology and Systems, and deputy director of the Society for Virtual Reality and Visualization Technology Professional Committee. She received her Ph.D. degree from Beihang University in 2005, was a visiting scholar at the Department of Computer Science, Hong Kong University of Science and Technology in the summer of 2006, and was a visiting scholar at the Department of Computer Science, Purdue University, USA from 2010 to 2011. Her research interests include virtual reality, augmented reality, and computer graphics. She has presided over scientific research projects such as key projects of the National Natural Science Foundation of China, general projects of the Natural Science Foundation of China, national key R&D projects and national 863 projects. She won the first prize of the National Science and Technology Progress Award, the second prize of the National Invention Award, and the first prize of the Science and Technology Progress Award of the Electronic Society. She has published more than 50 articles in top international journals and conferences related to virtual reality, IEEE TVCG, IEEE TIP, IEEE VR, and IEEE ISMAR. She has applied for more than 20 national invention patents, of which 12 have been authorized. She is the chair of IEEE VR 2021, 2022 program committee, the chair of IEEE ISMAR 2021, 2022 program committee, the member of IEEE ISMAR 2020 & 2019 program committee, and the chair of ACM VRST 2015 program committee.

Title: 3D Rendering in Virtual Reality

Virtual Reality (VR) is an important technical field to promote the integrated development of the country's future technology industry. Our country is facing a rare opportunity to simultaneously participate in the innovation of the international technology industry. Promoting the research on basic theories, common technologies and applied technologies related to virtual reality and augmented reality is a key task for the development of the country's virtual reality industry. Immersion, Interaction, and Imagination are the three basic features of virtual reality (3I features). The 3I feature poses a huge challenge to the virtual reality rendering technology. Efficient and realistic rendering in a virtual reality system can avoid dizziness caused by excessive delay in presentation of content, mismatch between what the user sees and their actions and behaviors, and confusion in the sense of balance. Virtual reality rendering technology is one of the most core basic theories and common supporting technologies in virtual reality. It plays a vital role in virtual reality

immersion, interactivity, and conception. The quality of rendering is one of the decisive factors for virtual reality to move towards large-scale applications. A series of high-immersion rendering methods are proposed for virtual scenes and virtual objects to take into account the high fidelity and computational efficiency of rendering results. Mixed reality panoramic video bidirectional shadow method realizes the real-time generation and rendering of realistic shadows in the mixed panorama with virtual objects for the first time. Human vision perception-based complex dynamic virtual scene rendering methods maintain high-quality rendering of the gaze area, the calculation speed is increased by an order of magnitude compared with the previous methods, and the immersion of the rendering is improved.