
High-speed and high-quality computer-generated holography with deep learning assistance

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As a three-dimensional (3D) display method, computer-generated holography (CGH) can achieve accurate reconstructions of the target light fields based on diffractive optics. It has broad applications in metaverse communication, AR/VR head-mounted displays, and automotive head-up displays. High-speed calculation and high-quality reconstruction of phase-only holograms (POHs) are key issues that should be emphasized in this field. In recent years, the leapfrog development of deep learning has provided a novel path to address this challenge. Here we will introduce our recent works about data-driven and model-driven deep learning methods for high-speed and high-quality computer-generated holography. High-fidelity color 3D optical reconstructions were accomplished.



Short Bio:

Liangcai Cao received his BS/MS and PhD degrees from Harbin Institute of Technology and Tsinghua University, in 1999/2001 and 2005, respectively. Then he became an assistant professor at the Department of Precision Instruments, Tsinghua University. He is now tenured professor and director of the Institute of Opto-electronic Engineering, Tsinghua University. He was a visiting scholar at UC Santa Cruz and MIT in 2009 and 2014, respectively. His research interests are holographic imaging and holographic display. He is a Fellow of the Optica and the SPIE.