
Research Progresses and Challenges for Polarization Volume Gratings Based Waveguide Display

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Polarization volume gratings (PVGs) have emerged as a promising grating technology due to their exceptional diffraction properties. In recent years, PVGs have demonstrated vast potential for various optical applications, particularly in augmented reality (AR) applications. This paper presents a comprehensive review of PVGs technology, covering physical principles, diffraction characteristics, and fabrication methods, based on the latest research advancements. The advantages of using PVGs as waveguide coupling elements in diffractive optical waveguides (DOWs) systems for AR applications are compared with other alternative schemes. In addition, this paper reviews the current research progress of PVG in DOW-AR applications related to color imaging, field-of-view extension, and pupil extension to demonstrate further the feasibility and practicality of PVG technology for waveguide applications and to provide references and inspiration for future research.



Short Bio:

Yuning Zhang received his PhD degree in Physical Electronics from Southeast University, China. He is a professor of Southeast University China.