

LightTrans talk at OASIS 2019

Optimization of Coupling Gratings for Lightguide-Based Displays

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Abstract

Recently, lightguide-based display devices are drawing growing interest, and one of the key technologies of such devices is the coupling gratings for the lightguides. In this work, we start with the optimization of coupling gratings for a single incident direction and analyze the effect when such optimized gratings are used in different situations. By that, it will be shown that getting uniformly high efficiencies over a wide field of view (FOV) is very challenging. Next, we analyze the situation of lightguide coupling in the spatial-frequency domain and present the possible strategies and freedom in the design. Finally, we present a complete optimization example for a desired FOV and evaluate the optimized uniformity in the diffraction efficiencies.