LightTrans poster at DGaO 2019

# Freeform, HOE, DOE, Diffuser, Metasurfaces – Different Ways for Light Shaping and How They are Connected

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**Abstract**

We consider the shaping of the irradiance in the far field which includes the special case of shaping the radiant intensity. The target pattern might be for example uniformly shaped light distributions or point clouds. Modern applications are not restricted to the paraxial assumption anymore and we need a non-paraxial concept for the modeling and the design of such light shaping situations. We present a unified mathematical concept for such light shaping tasks, which is based on the concept of homeomorphic operations. Dependent on the task, different light shaping approaches follow directly, including freeform surfaces, holographic optical elements (HOE), diffractive optical elements (DOE), diffuser, and shaping by metasurfaces. The systematic design approach uses design concepts in the functional as well as the structural embodiment of the optical system. We briefly present the theory and a variety of solutions and limitations, including freeform shaper, diffractive point-cloud generator, and diffusers.