Advancements in singlprojector immersive displays for compact performing transportable simulators

Peter DeMeerLeer

ABSTRACT

In recent years, projectors have become more performing. Their brightness has increased and also the resolution has gone up consistently, to a level that immersive simulation displays with a single projector and attractive specifications come into reach.

Using a single projector for a visual system has the advantage that it requires less time to set it up as it is no longer necessary to align a number of projectors in the system. This is especially interesting for transportable displays that are set up and torn down regularly and in a short period of time.

Using spherical screens with a single projector on simulators has been tried before with projectors equipped with special F-theta lenses but this method has the drawback that the lenses are very expensive, that the projector usage is not very good and that the projector typically has to be placed where the user is.

This paper describes the research on advancements in single projector immersive displays for transportable simulators through the use of non-spherical mirrors. It explains different design methods and their advantages and limitations and shows what is possible with optical surfaces to optimize the pixel usage of the projector onto the system screen. In practice, it will explain how the illumination of a spherical screen with a single projector has been optimized for a transportable mini-dome and what performance can be reached but also what the limitations to such a design are.

BIO

Peter De Meerleer

VP Strategic marketing and R&D for Esterline Simulation Visual Systems

Peter De Meerleer is worldwide responsible for strategic marketing and R&D in Esterline Simulation Visual Systems.

Peter started his career in 1994 in Barco developing projector products. In the following years, he headed multiple development programs for projectors and network centric collaboration products for a multitude of niche markets.

Starting 2005 till 2014, Peter headed the international Strategic Marketing team of Barco Training & Simulation.

From 2015 onwards, Peter joined the Esterline Company as part of the acquisition of the Simulation Visual Systems group where he today manages both the strategic marketing activities for Esterline's TREALITY branded simulation products and the worldwide R&D team of Esterline Simulation Visual Systems. He has been instrumental in Esterline's development of visualization products and systems and holds several patents.

Peter has a Master of Science in Physics Engineering at the University of Ghent and he lives in Belgium with his wife and his 3 children.