Lumenaut - Spatial Positioning and Game Design Tools for Intuitive Stage Lighting Control

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Theatrical and event lighting design is a collaborative process with many factors which can change as a production develops. A common frustration is a difficulty in sharing creative ideas due to the technical knowledge required to produce a visual artefact to aid this process. After engaging with professional practitioners through a series of surveys and semi-structured interviews, a paradigm shift in lighting control technologies was posited, and a testing system was developed using Unity 3D to determine the efficacy of a novel approach to this problem.

A new paradigm developed with intuitive operation as the focus is presented, leveraging the relatively mature field of video game controls and design principles as an archetype for the end-user interface. This is combined with an alternative method of communication between fixtures, breaking from the traditional approach and leveraging the power of extended reality-compatible multiplayer game technologies and real-time location tracking capabilities. The result is a system able to utilise additional data to aid end-users in the planning and production of lighting designs and facilitate more intuitive operation with less prior knowledge assumed.

Testing of the system with targeted industry practitioners has demonstrated a positive reception across a range of metrics when compared to existing commercial solutions. This includes faster operation with fewer errors and a measured increase in reporting of confidence in using the system, combined with enhanced system usability scores for a range of typical industry scenarios. Further work has now commenced in developing the paradigm to a fully realised specification and a working demonstration of the system is presented for discussion.

Keywords—Stage Lighting Design and Control, Pre-Visualisation, User Interface Design, Spatial Positioning, Human-Computer Interaction.