Design Flow for Modern Visual Displays

Timothé Jahan

ABSTRACT

In the early days of simulators, there were no design tools fitting Visual Display Systems (VDS) design. This made it challenging to accurately predict system performances. As such the system designer suffered from limited prediction accuracy for complex designs, and had to make a tradeoff between overdesign versus design iterations. Over the years, the design tools evolved, to finally give light to dedicated tools for VDS design and integrated design flows.
Nowadays, while VDS strive for excellence in performances, they also require tighter cost control than ever. These seemingly contradicting requirements call for both accurate predictions of performances and a specification-to-implementation flow limiting opportunities for error. This comes to a level which can challenge even modern design flows in case the tools do not go the extra mile versus just being dedicated software.
In order to live up to the challenge, the flow must start well before the VDS specification is ever written or proposed, via an in depth characterization of all components, such as for instance projectors and screens. Studies also need to be done to determine best prediction algorithms and the impact of various parameters on the final display. The results of such groundwork are then to be used in the design tools, which in turn allow finding the right configuration for the right application.
One should also realize the importance of a smooth transition from the conceptual optical configuration to the actual mechanical design and onsite implementation, with its associated pitfalls when not operated in a controlled manner. The optical design tool shall therefore provide the appropriate interface with the mechanical design tool and alignment tools, if ever different. Last but not least, the loop will be closed by feeding the field experience back into the flow for continuous improvement.
Strong by years of design, integration and implementations of VDS, this paper will dive into this high-end modern flow. It will highlight the key processes and tools required to tackle each of these challenges, leaning on the example of the Esterline Simulation flow developed and used over the years, articulated around the SimCAD™ simulator design software.

BIO

Timothé Jahan

Timothé Jahan has been working for Esterline Simulation Visual Systems and previously for Barco Training & Simulation for over 4 years as Technical Project Manager. He specialized in studying and designing visual systems, ranging from mid to high-end. Thanks to close interactions with worldwide customers he built key knowledge on ins and outs of system design. He has triggered and led multiple initiatives, related to the design flow as well as to technological innovations. In his previous experience as mixed-signal chip designer for the automotive industry he has been confronted to the very challenging cost versus reliability requirements of this industry. He owns a master in micro-electronic design from the “Institute of Electronic & Digital” (ISEN) of Lille, France.