

## *Optimal Resolution Improvement for FAA Helicopter Training*

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### **ABSTRACT**

High Frame Rate (HFR) projection systems present an opportunity for a quantum leap in the visual performance of flight simulation training systems, yet little analysis has been done to quantify the performance gain for simulation-specific content. As helicopter applications necessarily prioritize dynamic resolution, this paper quantifies the performance benefit of HFR for safety-critical FAA Level D helicopter training tasks. The analysis in particular compares a doubling of static resolution to a doubling of frame rate to determine the most efficacious investment, given that image pipeline resources directly impact system cost and complexity. The conclusions show that for the vast majority of scene content within safety-critical Level D helicopter training tasks, HFR indeed presents significant improvement over static resolution increase. The results are amplified by the fact that when the dynamic resolution benefit is equal for a doubling of either static resolution (4k) or a doubling of frame rate (HFR), the frame rate increase is generally more cost effective. This is because image pipeline requirements scale quadratically for static resolution and linearly for frame rate.

### **BIO**

**David Emig**

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David Emig has substantial experience in electro-optical systems design and optical system characterization. He has delivered innovative display designs and developed patented technologies for Motorola's Display Design Center. David is currently a Staff Display Systems Engineer for FlightSafety International's Visual Simulation Systems division and focuses on display systems design and new technology development.