

The Use of a Virtual Printer Model for the Simulation of Imaging Systems

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ABSTRACT

In a companion paper we discuss the impact of statistical variability on perceived image quality. Early in a development program, systems may not be capable of rendering images suitable for quality testing. This does not diminish the program need to estimate the perceived quality of the imaging system.

During the development of imaging systems, simulations are extremely effective for demonstrating the visual impact of design choices, allowing both the development process to prioritize these choices and management to understand the risks and benefits of such choices. Where the simulation mirrors the mechanisms of image formation, it not only improves the simulation but also informs the understanding of the image formation process. Clearly the simulation process requires display or printing devices whose quality does not limit the simulation.

We will present a generalized methodology. When used with common profile making and color management tools, it will provide simulations of both source and destination devices. The device to be simulated is modeled by its response to a fixed set of input stimuli. In the case of a digital still camera (DSC), these are the reflection spectra of a fixed set of color patches -e.g. the MacBeth DCC, and in the case of a printer, the set of image RGBs. We will demonstrate this methodology with examples of digital still cameras and print media.

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