Perception and Modeling of halftone Image Quality Using a High-Resolution LCD

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Abstract
The purpose of this experiment was to evaluate the usefulness of an image appearance model in predicting the visibility and/or the perceptibility of the noise in various halftone imaging techniques. In this process a paired comparison psychophysical experiment was developed to, first, collect subjective quality data on noise levels for the various halftoning techniques studied. Next an image appearance model (iCAM) was used to create an objective noise metric. The objective and subjective quality scales were then compared. A paired comparison psychophysical experiment was developed to evaluate the performance of five halftoning algorithms through softcopy displayed on a high-resolution LCD. Two different resolutions were simulated by varying the viewing distance. The round dot simulation was used to generate the softcopy halftoned images and the iCAM image quality model was used to predict the psychophysical experiment result. The CSF with various peak and shape is used to compensate the contrast sensitivity function for adaptation and different viewing distances. Results show that the simulated halftone image quality is similar to expectations from experience with printed images and the iCAM image difference metric can predict the general trends in algorithm preference.

Author Biography
Changmeng Liu received his B.S. degree in Electronic Engineering Department from TianJin University (China) in 1996 and M.S. degree in Computer Science Department from the Rochester Institute of Technology in 2002. He is a Ph.D. candidate in the Munsell Color Science Laboratory at the Chester F. Carlson Center for Imaging Science at the Rochester Institute of Technology. His current interests include color appearance, image quality, color management, and digital Halftoning.