



Image Integration

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Image Phi: A user-friendly tool for estimating Photospace, and its application to Cell Phone Cameras.

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Abstract:

The knowledge of photospace is extremely important for predicting the image quality performance of a camera for its expected usage conditions. Cell phone cameras are frequently used in low-light situations where the lack of a flash and limited exposure time will produce underexposed images. Handheld picture-taking at close distances can introduce blur. Objective image quality laboratory measurements will not correctly predict the customer experience of quality if the test exposure conditions do not represent common usage. However, if the photospace distribution – the frequency of pictures taken at varying light levels and camera-subject distances – is known, the distribution of quality as experienced by the typical user can be determined either through direct measurement of subjective quality or through laboratory measurements of objective quality. In both cases the determination of the user experience is a result of a sampling process consistent with the photospace distribution.

We introduce Image Phi, a user-friendly tool for populating photospace distributions by examining sets of images taken under typical usage conditions. Although some information could be extracted from metadata, these are not consistently used by cell phone cameras and therefore photospace data are estimated from the image content. For this a sampling protocol has been established that requires the observer to place each independent photospace variable in a limited number of intervals.

Representative photospace distributions of cell phone camera usage will be shown as well as examples of image capture performance by reference to objectively measured image quality parameters such as sharpness and Noisiness.