Saliency Detection with Flash and No-flash Image Pairs

**ABSTRACT**

In this paper, we propose a new saliency detection method using a pair of flash and no-flash images. Our approach is inspired by two observations. First, only the foreground objects are significantly brightened by the flash as they are relatively nearer to the camera than the background. Second, the brightness variations introduced by the flash provide hints to surface orientation changes. Accordingly, the first observation is explored to form the background prior to eliminate background distraction; the second observation provides a new orientation cue to compute surface orientation contrast. These photometric cues from the two observations are independent of visual attributes like color, and they provide new and robust distinctiveness to support salient object detection. The second observation further leads to the introduction of new spatial priors to constrain the regions rendered salient to be compact both in the image plane and in 3D space. We have constructed a new flash/no-flash image dataset. Experiments on this dataset show that the proposed method successfully identifies salient objects from various challenging scenes that the state-of-the-art methods usually fail.

This paper was presented at the 13th European Conference on Computer Vision (ECCV), Zürich, Switzerland, September 6–12, 2014. ECCV is the premier bi-annual Computer Vision event comprising the main ECCV conference and several co-located workshops and short courses.

Supervisor: Dr Rynson W.H. Lau
Research interests: Computer Vision; Image Processing; Computer Graphics

All are welcome!