A local tone mapping operator for high dynamic range images

ABSTRACT

In this paper, we present a new tonemapping operator to display high dynamic range image onto conventional displayable devices and printers. In our work, a new tone map algorithm, derived from the Contrast Limited Adaptive histogram Equalization (CLAHE) technique is presented. Due to different luminance intervals could result in overlapped reaction on the limited response in limited response range of visual system, we use scenes region splitting and merging to segment the scaled luminance, L(x, y) and perform the CLAHE in each segment with different clip limit in order to extending our visual response range to cope with the full dynamic range of high contrast. Until now, there is no fix standard of objective evaluation available to measuring the quality of displayed High Dynamic Range (HDR) images because it is difficult to know how the light or dark the image should be displayed to faithful to the original HDR image. As the result, the main evaluation is based on human's subjective evaluation. In this paper, we consider this to evaluate the performances with different tone mapping method.

Keyword: CLAHE; High dynamic range; Image; Luminance; Tonemapping