Display of High Dynamic Range Images on Conventional Displays (Ramot)
code: 4-2008-34
Hedva Spitzer, T.A.U Tel Aviv University, Engineering, School of Electrical Engineering

The Invention

Current image acquisition and processing allow construction of images with a very wide range of luminous levels. The invention is a method for intelligently manipulating the luminous levels into a displayed image where a maximum amount of significant viewable detail can be simultaneously displayed. The algorithm is based on a visual model which includes retinal receptive fields and retinal adaptation mechanisms (gain control). The adaptation mechanism is related to local and remote mechanisms, and based on curve-shifting effects. This algorithm succeeds in automatically compressing the dynamic range of images up to about 10 degrees of magnitude of intensity.

Potential Applications

The method can be used for graphic programs for image viewing improvement. It can also be implemented in situations where overlays of the same image are viewed in separate luminance range windows. It can be applied to HDR Cmos cameras.

The Need
Conventional viewing displays are limited to 256 luminous levels. High quality images that contain many more luminous levels are down sampled into this range which reduces view ability of many details. For example, the flash of a camera can render certain areas of a frame very bright, so that all detail is lost. The contrast can be offset to reduce the maximum brightness but in that case less illuminated areas will be lost. Simple luminous range stretching can be performed, but this does not result in optimized viewing. The TAU team chose an algorithm that understands the physiological components of human viewing of images and can individually optimize the contrast manipulation in order to achieve the best contrast definitions.

Advantages

The TAU group has constructed an algorithm that both compresses and expands (com/pands) the dynamic range of contrasts in an image, where this data exists in both standard images (256 intensity leveles) and HDR images (High Dynamic Range).

Patent

US and European patent applications and granted

Contact for more information:
Ofer Shneyour ✉,   VP Business Development, ICT,   +972.3.640.6496
_____

Ramot at Tel Aviv University Ltd. P.O. Box 39296, Tel Aviv 61392 ISRAEL
Phone: +972-3-6406608
Fax: +972-3-6406675

_____

ITTN - Israel Tech Transfer Network
Yeda Research & Development Co. Ltd, P.O Box 95, Rehovot 7610002, Israel, Telephone: 972-8-9470617, Fax: 972-8-9470739

Page 1/1