Techniques for evaluating exposure in digital cameras

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Abstract:
In this study we concentrate only on the techniques of evaluating the exposure in digital cameras, how to read and interpret each technique, and we will not touch the techniques of measuring light, incident or reflected and will not touch the factors of exposure control: aperture, Shutter speed, shutter angle, frame rate, neutral density, or iso sensitivity. Statement of the problem: The misreading of any of the exposure assessment techniques offered by digital cameras causes many problems that affect the quality of the final image and hinder the achievement of the objective of the image. These problems can be summarized in (1) Loss of detail in high light areas or shadows areas of the image. (2) Some parts of the image appear at a higher or lower brightness than the photographer / director of photography wants. Objectives: The aim of this study is to study the techniques of the exposure assessment offered by digital cameras to find out how to read and interpret each technique, so that we can judge accurately the levels of luminance produced by the digital camera of different parts of the image. Thus, the exposure or ratio of lighting contrast between the different parts of the scene being photographed can be changed to obtain the final result that achieves the objective of this photographic, cinematic or television picture. Methodology: the analytical descriptive method by studying how each of the techniques used by digital cameras to evaluate exposure in the digital image, so as to judge the actual levels of brightness produced by the camera for different parts of the scene. Conclusions: (1) All techniques used by digital cameras to assess exposure cannot be viewed separately from the scene being filmed, but must be checked during filming, compared to the original brightness levels of different parts of the scene. For example, the histogram may be clustered to the right, i.e., most pixels produce high levels of brightness. This diagram may reflect a correct exposure if most parts of the original scene are high-luminance, and the same scheme may express an over exposed image if the parts are high luminance from the original scene is a few and not predominant. In this case, the overall exposure to the image must be adjusted by shooting again: either by using a narrower lens aperture, or by reducing the intensity of the light falling on certain parts of the image. (2) For accurate photographing the parts of the scene being shot without loss of detail in both high light areas or low light areas, be careful to control the intensity of the light falling on each part of the scene so that the high lighting areas do not exceed the maximum level of assessment techniques, and low-light areas do not exceed the minimum level of any valuation techniques. (3) Since the missing details cannot be restored in the high-light areas of the scenes, while the details can be greatly improved in the shadows areas during post-processing. If the photographer / director of photography has any doubt about the validity of the exposure, try to reduce the exposure slightly to ensure that the details of the scene are preserved without any loss.

Keywords:
Digital Cameras, Exposure, Histogram, Waveform Monitor, Zebras, False Color Exposure