



TECHNOLOGY

Reduced-Reference Quality Assessment for Retargeted Images

OVERVIEW

Background

Image retargeting, which can be achieved by various modern techniques such as seam carving, is an operation performed on digital pictures in order to display them in various viewing screens and formats. Unfortunately, a retargeted image inherently loses or alters the informational content of the original picture, and retargeting operations inevitably bring visual distortion to the picture. Since mobile media consumption on various mobile devices is an increasing trend, image retargeting will see greater use in the near future. A quantitative quality metric is needed to assist content developers in retargeting images while reducing the perceived change from the original image.

Innovative Technology

University of Maryland researchers have developed a reduced-reference algorithm to analyze the structural distortion caused by retargeting and propose a quality score that achieves positive correlation with human observations. The quality score and distortion analysis from the proposed algorithm provide rich information for both objective and subjective quality assessment tasks. Furthermore, the distortion map provides an important tool to assist users in evaluating image quality with their own preferences instead of being forced to accept a single quality score. Future work may make it possible to reconstruct the original image from the retargeted image.

Advantages

- Quantitative quality score for objective quality assessment of retargeted images
- Positive correlation with subjective human ratings
- Reduced-reference algorithm that does not require availability of original digital image. This makes it applicable for real-world applications by requiring only minimum storage overhead when distributing the image.
- In addition to quality score, the algorithm provides detailed distortion analysis with rich information.

Applications

- Help improve retargeting algorithm to produce higher quality mobile media
- Image quality monitor and control in mobile image distribution and consumption

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