



Efficient Video Retargeting Approach That Avoids Jitter

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method and device for processing video data with region-based warping that provide a tradeoff between temporal coherence in the background and shape preservation of the moving objects.

Overview

Image and video resizing involves adapting an image or video to displays with different sizes and aspect ratios, often resulting in warping or distortion. Video retargeting addresses the problem of adapting a video for display at a different size and aspect ratio than originally intended. However, current approaches either sacrifice temporal coherence, leading to jitter, or require expensive space-time optimization.

The Invention

UW–Madison researchers have developed a video retargeting approach that provides both efficiency and temporal coherence. This method warps specific areas of each frame independently, yet avoids introducing jitter. Like previous approaches, this method warps frames so that background regions are distorted similarly to prior frames while avoiding distortion of the moving objects. In contrast to previous methods, this approach introduces a motion history map that propagates information about the moving objects between frames, allowing for graceful tradeoffs between temporal coherence in the background regions and shape preservation of the moving objects.

Applications

- Video streaming over the internet
- Improved displays on mobile devices such as iPhones

Key Benefits

- Provides the first video retargeting method that can achieve high quality results with reasonable and scalable computational costs
- Capable of handling scenes with significant camera and object motion
- Avoids jitter
- Warps each frame sequentially for efficiency
- Streamable, i.e., can be used without knowing the whole video, making it capable of processing long videos and potentially useful for processing live events in real time
- Suitable for a variety of video types, including cartoons, feature movies and home videos

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Several successful experiments with commercial movies and YouTube home videos demonstrated that this approach can efficiently produce high quality video retargeting results.

Additional Information

For More Information About the Inventors

- [Michael Gleicher](#)

Publications

- Niu Y., Liu F., Li X. and Gleicher M. 2010. Warp Propagation for Video Resizing. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition.

Tech Fields

- [Information Technology : Image processing](#)

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