Smart Resize of Images & Videos

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Overview

Data storage of images and videos became a real issue in the last years when pictures and videos are taken and shared more often, and the memory devices aren't being minimized fast enough.
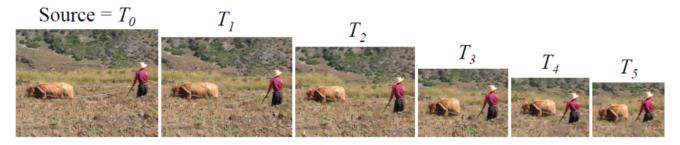
Prof. Michal Irani and her team have developed an algorithm that can resize images while keeping the important features without any undesired artifacts.

The Need

Camera phones and social media made images and videos more accessible and widespread than ever before. When taking a picture, we capture additional less important features that consume memory along with the focused object. When resizing images, it is hard to remove the less important features while keeping the high resolution of the main objects.

The Solution

Bidirectional Similarity offers a new approach to summarizing visual data (images and video) based on optimization of well-defined similarity measures.

Smart resize: fewer pixels with the same main features

Technology Essence

The algorithm uses an iterative process, gradually reducing the image size while keeping all source patches in the target image without introducing visual artifacts in the input data. Utilizing a similarity index, the algorithm identifies redundant information and compromises the "less important" data while generating the required target image or video.

Applications and Advantages

Applications

- Resizing app
- Creation of Thumbnails
- Adjustment of images to different screen sizes (TV-cellular etc.)
- Optimization of space-time patches in video processing
- Image montages
- Automatic image & video cropping

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Advantages

- Provides better resolution and, in many cases, reduces distortion compared to scaling
- Reduces (or avoids) loss of important data compared to cropping
- Allows importance-based summarization even when vital information is widespread and hard to define
- Uses quantitative objective similarity measure
- Offers a generic tool for different image processing applications (synthesis, montage, reshuffling etc.)

Development Status

Completed

Market Opportunity

Reducing the consumed memory of each picture by resizing is highly relevant for mobiles, where memory storage is limited. This algorithm could also be used as a â€œsmart croppingâ€ tool for image processing software (such as Photoshop, etc.) or â€œsmart fittingâ€ of pictures to different screen sizes for smart TVs.

Patent Status

USA Granted: 8,542,908