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Prime Tool for In-Browser Image Resizing

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ABSTRACT

Seam carving is a common technique for content-aware image resizing that repeatedly removes low-energy seams without considering the overall visual impact of the image. It's computationally intensive. In some cases, unavoidable seams pass through his ROI, distorting the ROI geometry. Low energy ROI cannot sustain seam carving. We proposed a piecewise approach that can maintain low-energy ROI and minimize shape distortion. Parallel algorithms can be used to improve speed. It is further optimized by automatically identifying ROIs using saliency maps and segmenting images in addition to interactive images. It is hybridized with a shift map editing approach for adjusting structural deformations.

keyword:
oPSC – optimized piecewise seam carving, ROI – regions of interest, saliency maps, displacement maps.

INTRODUCTION

Image retargeting is becoming more and more common as there are too many display devices with different architectures and resolutions on the market. While resizing an image for retargeting, it is desirable to retain visually prominent areas of the image. Seam carving [1] has recently gained much popularity as a content-aware image resizing method, in contrast to traditional image resizing methods such as scaling, cropping, and warping, which are not suitable for image enhancement. increase. Non-Uniform Scaling and Stretching [2], Fisheye View Warping [3] employs different scaling techniques and suffers from the same drawbacks as scaling. Figure (1) compares the results of seam carving, scaling, cropping, and warping. Seam carving removes inconspicuous pixels and resizes the image to preserve the region of interest (ROI). However, large scale engravings and dense image content will distort the ROI and reduce the overall visual impact of the image. Seams inevitably pass through oblique objects, causing artifacts. It also cannot hold geometric shapes. seam engraving. The energy function in [1] computes the best seam by finding the pixel that gives the lowest energy in the image, so it cannot prevent low-energy ROIs from being clipped. Seam carving is a discrete method that operates on individual image pixels and uses dynamic programming to calculate seams. This involves complex calculations. Section 2.1 provides an overview of seam carving. Many attempts have been made to improve the efficiency of seam carving, i.e. the speed of computation or the quality of the output produced. It also hybridizes with other resizing methods to use their positive sides efficiently and minimize the negative effects of each other.

WORKING OF PROJECT

Seam carving resizes an image by removing or duplicating large numbers of low-energy pixels in the image called seams. A seam is an optimal 8-connected monotonic path of pixels from top to bottom (vertical seams) or left to right (horizontal seams) in an image. Removing/inserting seams like this doesn't create much visual attention. Repeatedly cutting and pasting seams changes the aspect ratio of the image and changes the orientation of the image. Pixel optimality is defined by the image energy function. Although seam carving is more efficient than other traditional image resizing methods, it is not without its drawbacks. There are some limitations as shown below.

i) Seam carving gradually removes or inserts low-energy pixels until the desired image size is reached, without considering the actual visual effect.
ii) cannot save his ROI of relatively low energy that cannot be excised;
iii) If the region of interest (ROI) in the image is close together or depending on the orientation of the image, the seams may inevitably bypass the region of interest, thereby distorting the region of interest. Me

iv) Seam carving is a separate process that performs per-pixel calculations and the energy map is recalculated after each seam is carved/pasted, making seam carving a time consuming process.

EXAMPLE OF DIAGRAM

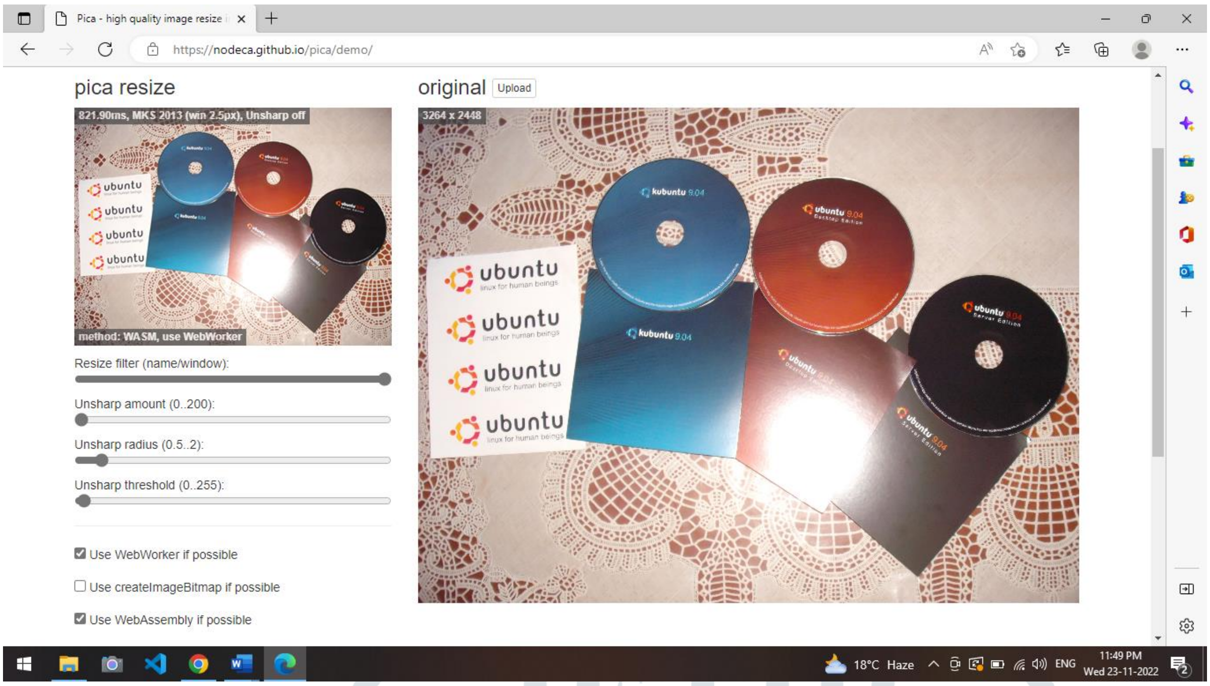
(a) Image with dense ROI (b) Oblique orientation of Object

Fig. Diagram of Proposed System

METHODOLOGY

The piecewise approach decomposes the image into multiple segments and allows the user to seam each segment in the desired proportions. The user can choose the direction of segmentation (vertical or horizontal) and thus the seam direction. The user interactively selects some points on the image where the image is segmented in a given direction and marks its segment boundaries (Xmin, Xmax/Ymin, Ymax). The image matrix Inxm is divided into v subarrays. Segment numbers (Gk) are assigned in stages. Seams are calculated using additional constraints within the segment boundaries. The number of seams allowed in each segment is set by the user. The pattern is resized in the direction opposite to the sewing direction. If vertical segmentation is selected, the image will be segmented vertically along the selected pixels. Segment numbers are assigned from left to right, and Xmin and Xmax of each segment Gk define its segment boundaries. Then cut the segments individually to custom sizes (remove vertical seams). Removing vertical seams reduces the horizontal size (width) of the image. Similarly, for horizontal segmentation, Ymin and Ymax are the segment boundaries. A seam cut along the horizontal direction will change the height of the image.

MODEL OF PROJECT



CONCLUSION & FUTURE SCOPE

Our piecewise approach seems to outperform other existing methods in terms of output quality and computation time. Clever segmentation and shift map editing eliminate distortion caused by object warping. Retains low energy ROI. However, user interaction is required to find less visually appealing ROIs. Visually prominent ROIs are automatically identified by the saliency map. Calculating the forward energy gives better results for size variations than the energy function used in [1]. Figures 7-10 compare the results of image resizing with various other resizing techniques. Figure 11 compares the results of enlarging the images. Our approach has some limitations as shown in (i) to (iv), some of which are managed by post-processing the resized images by displacement mapping . (i) Subsequent segmentation of images in both directions results in a matrix of segments. Engraving each segment individually does not maintain the relationship of objects in adjacent segments and has less visual impact. In PSC[4], resizing is completed along one direction and then in the other direction. Here, shift map editing is applied to correct structural deformations and restore semantic relationships between objects. (ii) simply copy the sub-arrays that make up the segments across the array and merge the segments to form the resized image. However, you may see visual artifacts between segments. A pixel averaging method and a displacement map are defined to enable smooth blending of pixels between adjacent segments. (iii) Dense image content still poses challenges for PSC. This leads to massive segmentation and lower retargeting rates. (iv) I have not tested the efficiency of this algorithm in parallel. This is what I suggest doing in the future.

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