



A Review on Warping of Picture and Keywords by Using Different Techniques

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Abstract—In this paper, the new word art system is proposed, in which inputs are picture and the keywords which introduce some information about the input picture, and the output of this system is combination of input picture and input keywords. In traditional days this text-graphic were created by highly skilled artists and this was involving large amount of manual work, so this system is different from this traditional work. The proposed system is Automatic Image Warping System. It is type of automatic non-photorealistic rendering (NPR) packing system. In this method input picture is divided into two parts, one is main part and another is background part. The main part is useful part and background part is not useful part. The keyword will be packed in main part and background part will be ignored. Then the main part will be segmented into number of patches, each patch will work as container for one keyword. The more important keywords are put into large image patches for this we rank keywords as well as patches. Then keywords and patches warping are done with the help of mean value coordinates method. Lastly, the post processing techniques are used to improve effectiveness of picture.

Index Terms—Keywords, picture, non-photorealistic rendering, warping, Automatic Image Warping system.

I. INTRODUCTION

When any one sees a beautiful picture, such as a photo of any celebrity, then they want to know more information about that celebrity. The picture itself cannot tell the details as the birth date, nationality, experiences, etc. of that celebrity. Therefore they have to use other source information such as internet. On the other hands, if anyone read the information about any celebrity, they would like to see the photo of that celebrity. Such difficulties are very common in our daily life. To overcome the difficulty, can we design any system which generates an image which will contain celebrity face as well as summarization of celebrity’s biography at the same time? For this purpose we develop an Automatic image warping system. Two modalities (picture and keywords) are seamlessly combined together to better represent the human or object of interest. Automatic image warping system attempt to design a text-art to fuse an image and keywords.

This work is inspired by seeing different advertisement and posters which contain celebrity image and some introduction words. These posters are very attractive. Sometimes these posters are handmade. By using proposed system we are going to generate these posters automatically without any handwork. Proposed system can generate image for user in any social networking website, where persons photo and his/her blog can be combined together to better describe the user. The proposed system attempt to design a text-art to combine an image and its keywords in multimedia research area.

Automatic Image Warping System is non-photorealistic rendering (NPR), specifically it belongs to NPR packing. NPR is an area of computer graphics that focuses on enabling a wide variety of expressive styles for digital art. Different to traditional computer graphics, which create attention on photorealism, NPR is attracted by artistic styles such as painting, drawing, technical illustration and animation. NPR appeared in movies and video games in the form of “shading” as well as in scientific visualization. Artists and art lovers have always been fascinated by the interplay between a whole and its parts. The earliest NPR Packing art can be traced back to Roman mosaic where small squares of colored glass. If small elements are only words or letters then it is called as calligram. Calligram is a rich tradition and wide variety of styles limited only by artist’s imagination.

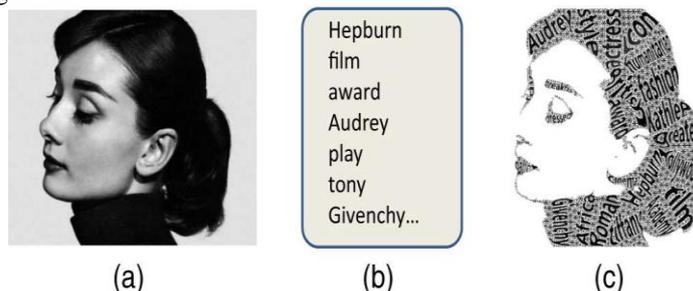


Fig. 1. (a) The source picture: The image of famous movie star Audrey Hepburn, (b) The keywords, (c) The target image.

The output of Automatic image warping system is attracted by Human Visual System (HVS) where two modalities (picture and keywords) are sequentially combined together. By seeing the output image of proposed system the general people will immediately identify the celebrity whose picture is present, but if they take a close look at the image they will gradually notice its keywords which introduce celebrity. The output of proposed system is natural combination of both picture and keywords. The whole generation process contains a picture-only module, a keywords-only module, a cross-modality picture & keyword module. In picture module image is converted into small patches and ranked, which act as container for output of keywords module which is ranked. In picture and keywords module, the two modalities are combining together by warping each word to its corresponding patch. And then finally in post-processing module image is refined to give attractive look.

II. RELATED WORK

Zhenzhen Hu, Si Liu, Jianguo Jiang, Richang Hong, MengWang and Shuicheng Yan [1] mean shift algorithm is used to segment the image into small superpixels (patches). Each superpixel is considered as a semantic consistent unit. We assume that the biggest meaningless patch near the picture boundary corresponds to background and is thrown away. The foreground is also segmented out simultaneously. We can see that the spatially nearby and visually similar pixels, such as the cheek area, are clustered together in the segmentation map. Next, we convert all foreground superpixels to greyscale image, which is further threshold into binary image. More concretely, the average luminance value of each patch is calculated, and only bright patches are kept. The threshold setting can be fully automatic or adjusted according to users' requirement. Finally, the binary map is refined and smoothed by applying a Gaussian filtering to remove tiny holes and blurs. It resembles the original image, but in a more abstract style. The success of PicWords comes from the fact that it can keep the region's contour and replace the region's original texture by placing some keywords. Keeping the contour can guarantee PicWords to resemble the original image while region keywords filling can serve as extra information complementary to the image content. But if the original image is textureless, such as Eiffel Tower or Golden Gate Bridge, PicWords will probably fail.

Now days, increasing efforts have devoted into non-photorealistic rendering (NPR). J. Kyprianidis, J. Collomosse, T. Wang, and T. Isenberg [2] Non-photorealistic rendering has two complimentary goals: the communication of information with the help of images, and rendering images in interesting and new visual styles which are different from traditional computer graphics constraint of producing realistic image. Non-photorealistic rendering subcategories as NPR packing. According to different kinds of cooperating elements styles, NPR packing is classified as mosaicking and calligram. Mosaicking algorithm is nearly related to packing problems, and therefore is approached universally as global optimization problems. Whereas packing strategies vary widely, they can be categorized into those obeying purely spatial or spatiotemporal constraints. To a contrary, the output image of Automatic image warping system is much more informative than mosaicking by seamlessly inserting the keywords as a components into the target image. Therefore, viewers can sense how the image looks like and can read brief information of the key objects inside the image.

Calligram is a word or piece of text in which the design and layout of the letters creates a visual image related to the meaning of the words themselves. Calligram originated in 1930s and it can be seen in many cultures and civilizations throughout history. Computer aided design of text-based art-forms has been explored in a different contexts. One well-known example is ASCII art a technique of composing pictures with printable text characters. In ASCII art textual and numeric characters are only the means to build an image; that is, single characters are not meant to convey meaning but to be perceived as components to form a whole. M. Nacenta, U. Hinrichs, and S. Carpendale [3] developed a technique called FatFonts based on Arabic numerals. This enables accurate reading of the numerical data while preserving an overall visual context. The drawback shared by the above mentioned systems is that no relationship exists between the target image and its components (text or Arabic number). Also, comparing with ASCII art and its variants, the output of proposed method can convey more information via packing keywords.

Stylization through text packing was later considered by R. Maharik, M. Bessmeltsev, A. Sheffer, A. Shamir, and N. Carr [5]. They presented an algorithm for creating digital micrography images, created from minuscule text. Their main focus is to stitch the words together to resemble a source image, and their words are usually too small to be recognized. To the contrary, the output of proposed method can make sure that most keywords are recognizable. And they divided up a target region into pieces and warped a letter into each piece. But their method can only process letters, and thus cannot convey enough information. However, the output of proposed method can contain much richer information.

Based on superpixel segmentation method P. Arbelaez, M. Maire, C. Fowlkes, and J. Malik [4], each color image is segmented into several small units. Comparing with mean-shift segmentation method, the adopted superpixel method generally generates the near-rectangular patches, which are more suitable for inserting keywords. Since we target at filling the foreground area with keywords, only the patches covered by the silhouette image are kept. To produce high-quality image segmentations, this contour detector is link with a generic grouping algorithm and consisting of two steps. First, we introduce a new image transformation called the Oriented Watershed Transform for constructing a set of initial regions from an oriented contour signal. Second, using an agglomerative clustering procedure, we form these regions into a hierarchy which can be represented by an Ultrametric Contour Map, the real-valued image obtained by weighting each boundary by its scale of disappearance. The problems of contour detection and segmentation are related, but not identical. In general, contour detectors offer no guarantee that they will produce closed contours and hence do not necessarily provide a partition of the image into regions. But one can always recover closed contours from regions in the form of their boundaries.

Image warping is a transformation which maps all positions in one image plane to positions in a second plane. It arises in many image analysis problems, whether in order to remove optical distortions introduced by a camera or a particular viewing perspective, to register an image with a map or template, or to align two or more images. The choice of warp is a compromise between a smooth distortion and one which achieves a good match. Smoothness can be ensured by assuming a parametric form for the warp or by constraining it

using differential equations. Matching can be specified by points to be brought into alignment, by local measures of correlation between images, or by the coincidence of edges. Parametric and nonparametric approaches to warping, and matching criteria, are reviewed. In the past most warping methods can work only when the source and target polygons are near-convex, otherwise produce unacceptable distortion. Therefore, we estimate the concave index of each super pixel by the method introduced of Z. Ren, J. Yuan, C. Li, and W. Liu [8]. If the concave index of one patch is bigger than a threshold, it is fed into the convex decomposition procedure. The original concave patch is split into two near-convex patches [8], which can greatly facilitate the later keywords warping process.

Shih-Syun Lin, I-Cheng Yeh, Chao-Hung Lin [9] Image warping are recent techniques of content-aware retargeting. Seam carving iteratively removes or inserts a seam passing through unimportant regions. This approach may generate jagged edges because of the removal of discontinuous seams. In contrast, image warping offers a better possibility of producing a continuous deformation for content-aware retargeting. An optimized scale-and-stretch warping using a quad mesh as a control mesh. This approach has the advantage of distributing distortions to homogeneous regions, as it forces quads with significant content to scale uniformly and distorts quads with homogeneous content. This approach can preserve the aspect ratios of local objects. However, for an object occupying many quads, an inconsistent deformation may occur because of the inconsistent scaling factors.

III. CONCLUSION

We develop an automatic Image Warping System. It can fuse one source picture and keywords seamlessly into one target. Viewer can sense the picture and read more details from the keywords at the same time. More important keywords have higher weights and are put into more salient and larger regions. Proposed system has great market potentials. It can be developed as an app for the social network to generate more vivid and informative user profile photos.

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