

A Review Paper on Interactive Image Segmentation

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Abstract: - Due to advent of computer technology Image processing techniques have become increasingly important in a wide variety of application. Image segmentation is the process that partitions an image into region. One weakness in the existing interactive image segmentation algorithms is the lack of more intelligent ways to understand the intention of user inputs. Interactive Image segmentation aims to separate an object of interest from the rest of an image.

Most of the previous work requires users to trace the whole boundary of the object. When the object has the complicated boundary, or the object is in a highly textured region, users have to put great effort into interactively collecting the selection. It achieves three goals from following three steps. First, merge over segmented region according to the maximal similarity rule using a few marking strokes as input. Second, detect possible erroneous low contrast object boundaries by analyzing image content. Third, automatically refine those boundary regions using both local and global information.

I. INTRODUCTION

Interactive Image Segmentation has many applications in image processing, computer vision, and computer graphics. Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. Our goal is to develop intuitive and intelligent image segmentation algorithms and tools that allow user to interactively guide the segmentation algorithm via a small amount of intuitive interactions until a satisfactory segmentation results that reflects both user intention and photometric features is achieved. The segmentation process is based on various features found in the image. This might be color information that is used to create histogram, or information about the pixels that indicate edges or boundaries or texture information.

For a good interactive image segmentation algorithm, there are two basic requirements: 1) given a certain user input, the algorithm should produce intuitive segmentation that reflects the user intent; 2) the algorithm must be efficient so that it can provide instant visual feedback.

Segmentation is of mainly two types

- Automatic segmentation:-It is a technique in which the background of any image is constant or fixed in nature. It refers to the process whereby segment boundaries are assigned automatically by a program.

- Interactive segmentation:-It is a technique which incorporates small amount of user interaction to define the desired content to be extracted, as received much attention in the recent years. In general, interactive image segmentation algorithm can be classified into two categories: boundary based approaches and region based approaches.

In boundary based approaches, the user is often asked to specify an initial area that is close to the desirable boundary.

In region based approaches, the user is often asked to draw two types of strokes to label some pixels as foreground or background, after which the algorithm completes the labeling of all other pixels.

II. RELATED WORK

The two categories of Interactive Image Segmentation include hard segmentation and Soft segmentation. Hard segmentation algorithm produces a binary map in which a pixel belongs to either foreground or background.

So It's segmentation algorithm extracting fractional matte for an image.

Interactive segmentation algorithm in early days uses either adobe's magic wand. The magic wand tool starts with a small user – specified region. Adobe magic wand includes boundary properties such as active contour and intelligent scissor. The magic wand tool grows through connecting neighboring pixels that for within some adjustable tolerance range of the color statistics of the specified region. The main problem with this method is that the contour is likely to be trapped in the local minimum. The intelligent scissors algorithm requires the user to place points along the desired contour of the foreground object. The problem with the intelligent scissors is that for the highly textured or un-textured regions there exist many alternatives minimal path, which requires large number of user interactions in order to obtain satisfactorily result.

The most recently used method is the Interactive Graph Cut Method which is based on improved Gabor features. This method integrates color features with reduced Gabor features and then employs graph cuts method to obtain segmentation method. Graph cut methods manage to find optimal segmentation boundaries and regions by taking image segmentation as the minimum cut problem in a weighted graph. The robustness is increased by the combination of color information in the graph cut method and an interactive learning approach.

III. LITERATURE SURVEY

Amarpreet kaur et al., [1] has proposed image segmentation as the one that divides the image into multiple parts in the form of pixel. To detect the object boundaries and other relevant data segmentation is used.

Vrushali mendhule et al., [2] has proposed the study of different technologies of interactive image segmentation for image of foreground background separation system. Technologies that are used for interactive image segmentation are intelligent scissors, adaptive GMMRF model, probabilistic hyper graphs, interactive graph cut method.

Tao Wang et al., according to [3] image segmentation are approached by segmentation problem which is formulated in probabilistic manner. Here the author measure similarities between pixel pairs and seed pairs to improve the robustness to the seeds. By imposing smoothing constraints on unary potential the work is proposed to blend the region and boundary information of the image.

Wenxian Yang et al., [4] proposed the solution of the use of multiple intuitive user inputs to overcome the weakness of the interactive image segmentation algorithm which lacks in understanding the intention of user inputs. The three types of user inputs are foreground and background seed input, soft constraint input and hard constraint input.

B Bhanu et al.,[5] presents the user selected set of examples and counter example about the specific segmentation problem of image segmentation. The genetic algorithm and special combination of collection of discriminating function is guides the image segmentation associated with image features.

Nida M. Zaitoun et al., several algorithm and techniques have been developed for image segmentation. Since there is no solution for the image segmentation problem, the technique has been combined with domain

knowledge. [6] presents the study of basic block based image segmentation technique.

Bibhas Chandra Dhara et al., [7] explains fast and simple interactive image segmentation techniques in two modules. In first, the original image is pre-segmented by a low level segmentation method. Second, some portion of image is marked. These two methods identifies all similar colored objects in the image.

Jifeng Ning et al., an important task in computer vision and object recognition is efficient and effective image segmentation. Interactive schemes with a few simple user inputs are good solutions since fully automatic image segmentation is usually very hard for natural images. [8] Presents the new region merging based interactive image segmentation method.

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