ORIGINAL RESEARCH PAPER

Engineering

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OBJECT LOCALIZATION USING SHAPE & FEATURE MATCHING

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ABSTRACT

Point matching is an important aim in the research work. A digital image may go through each uninformed translational, gyratory change because of which the object shape may change. More than a few algorithms have been proposed earlier involving feature matching. Herein manuscript we present a work of fiction approach for silhouette and attribute matching using putative point matching. The glide path is based on three source steps of image realization, verdict the feature points and matching. The research shows sturdiness to an assortment of types of turbulence as well as outliers detecting our object of interest.

INTRODUCTION

Digital image processing is the employ of computer algorithms to put together, course of action, communicate, and show digital images. Image registration is an image giving out method accustomed to align several scenes into a solitary incorporated image. It helps to conquer issues for instance image rotation, scale, and skew those are widespread when overlaying images. It is the procedure of transforming diverse set of data into a ordinary coordinate system. It is used in computer vision, medical imaging, military automatic target recognition, and compiling and analyzing images and data from satellites. When it comes down to it, the depiction may go through several rotations; translation due to which the point set corresponding becomes complicated [1] [2]. The image possibly damaged as taking the clips from camera or it perhaps contaminated with noise. The geometry of the object may also change making it an intricate task in object detection.

In remote sensing, mosaicing of images of the surveyed region, the images of the similar sight are acquired from dissimilar viewpoints. In automatic change recognition for safety monitoring and motion tracking images of the same scene are acquired at different period, a lot on regular basis, and maybe under unusual circumstances. In medical imaging, images of the similar sight are acquired by different sensors. In some cases evaluation of the patient's image with digital anatomical atlases is required wherein the images of a scene and a replica of the scene need to be registered. Consequently, in all these methods either the viewpoint changes or the images are taken at different period or possibly from different sensors. Due to all these the shape detection with point set matching becomes difficult approach for feature detection. Primarily the feature based method made up of the following steps image gaining, feature recognition, feature corresponding, like of image and transformation [4] Feature point matching [4] establishes the association between the points from two extracted images.

RELATED WORK

The transformation and the correspondence are normally regarded as the two unknown variables in a point matching problem. They share an intimate relationship. Once one variable is known, the solution for the other is actually mostly trivial. Given the set of correspondences [2] [3] (including the set of outliers), finding a good transformation is often a straightforward least-squares problem. On the other hand, given a transformation, we can apply it to one point-set and determine the set of correspondences using some proximity criteria. Consequently, if either variable is deemed known, the point matching problem is considered solved. This is the main reason why the point matching problem can represented as a problem using either variable (transformation or correspondence) [6], or both. While it may seem simpler to define the problem using a single variable, we will see that it is not necessarily the case for non-rigid point matching. Thus all point matching algorithms can be characterized by examining the way they handle the two variables. Insofar as a method attempts to solve either the correspondence or the transformation alone, it can be regarded as an independent estimation approach.

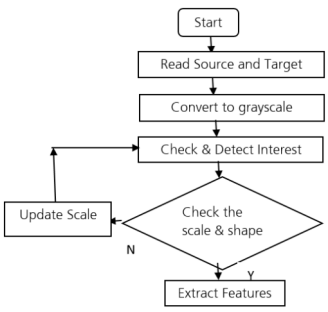
These methods are designed only for rigid point matching problem. A more refined technique is the Hough Transform [2] [3] in which the transformation parameter space is divided into small bins, where each bin represents a certain configuration of transformation parameters. There are numerous other methods such as tree searches, the Hausdauff Distance [2] [3], Geometric Hashing and the alignment method as well.

In these there are two major types of methods [4] designed for determining the shape matching between the images.

The rigid method groups the feature points into higher level structures such as lines, curves or surfaces. The non-rigid method is based on brightness (appearance) [4] making direct use of pixel brightness. In this instead of focusing on the shape or other extracted features, these approaches make direct use of gray values within the visible portion of object. There are many algorithms for rigid and non-rigid point set registration [6][7][8]. This involves a two-step iteration involving correspondence and transformation.

OUR APPROACH

The goal of proposed method is to detect object in an image. In this there will two images. One will be called as source image (Image in which we are interested) and second is the target image containing cluttered scenes. These images will be read and its feature point will be detected. Feature points of the image are its shape data, thresholding, circumference recognition, line representation, curve recognition, blob recognition etc. After these, the feature descriptors are extracted at the interest point in both images. Characteristic descriptors [4] [9] are the images of the visual features of the contents in images, videos, algorithms or applications that create such descriptions. They explain uncomplicated characteristics for example the shape, the color, the texture or the motion, with others. These features are coordinated in both the images using their descriptors. Show the matched features and place the object with outliers removed.



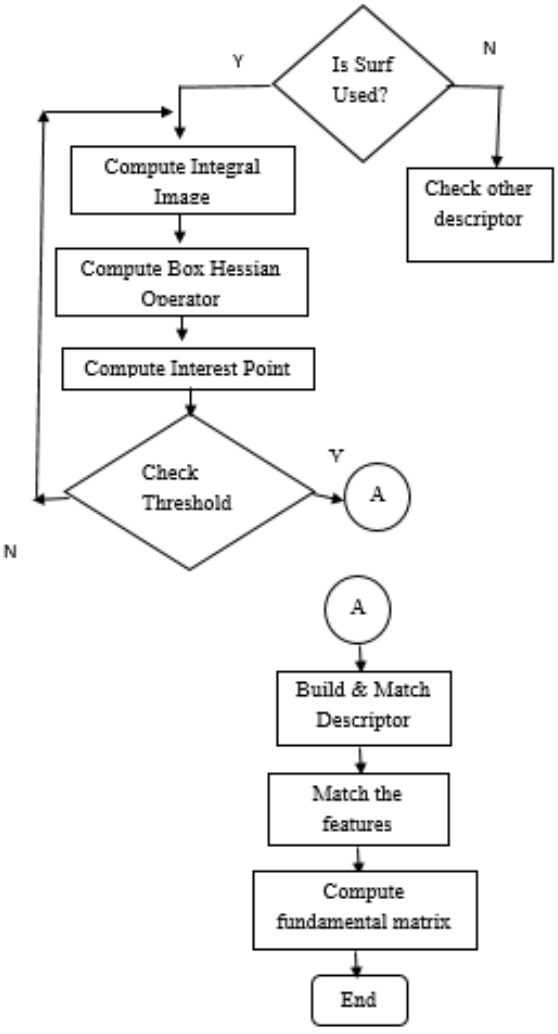


Fig 1: Flowchart of Proposed System

EXPERIMENTAL RESULTS

The experimental results of our project are as shown below:-

Fig. 2. Left Image: Object to be detected, Right Image: Cluttered Image

The figure 2 indicates the two image containing source and target. The left image is the goal image containing the object to be detected and right image is the cluttered scene.

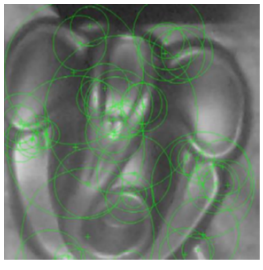


Fig. 3. Strongest Features in Image 1

The figure 3 extracts the strongest features in target image which includes edges, corner points, and blobs, ridges irrespective of its colour, size, and shape using feature descriptors. The feature descriptor depends on the features to be detected.

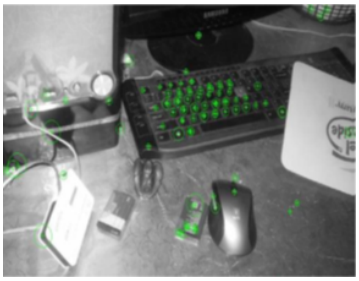


Fig. 4. Strongest Features in Image 2

The figure 4 extracts the strongest features in target image which includes edges, corner points, and blobs, ridges irrespective of its colour, dimension, and form using feature descriptors. The feature descriptor depends on the features to be detected.

Fig. 5. Final Matched points in both images

The figure 5 indicates the matched points from both images. It also detects the object and its location in cluttered scene.

CONCLUSIONS

Accordingly we have presented a new approach for point set registration using robust shape and feature matching. The algorithm detects the location of the object in the disorderly scenes. The algorithm is likely to work for all the images excluding the outliers with maximum efficiency. The earlier methods employed either only shape matching or feature matching using correspondence and transformation making the point set matching tedious job. Thus it increases the computational difficulty of the algorithm. However our algorithm doesn't involve any computational difficulty with maximum accuracy. The algorithm is likely to work for images having some amount of noise with maximum efficiency.

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