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Object Localization Using Feature Matching in Cluttered Scenes

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ABSTRACT

In many applications of computer vision, pattern recognition And medical image analysis, one common procedure Is to match two or more point sets, and nonrigid point set Matching is particularly difficult because the possible nonrigid Deformation of the model shape is numerous. In practice, the scene is often contaminated by clutters, making the point Set matching problem more complicated. In this paper, we focus on how to locate a deformable shape in cluttered scenes under the no rigid point set matching framework. The shape May undergo arbitrary translational and rotational changes, and It may be no rigidly deformed and corrupted by clutters.To address the problem of rotation invariant no rigid point set matching, they proposed two methods for shape representation. The shape context (SC) feature descriptor was used and we constructed graphs on point sets where edges are used to determine the orientations of SCs. This enables the proposed methods rotation invariant.The goal of this project is to automatically detect and recognize some objects in an image by using putative point matching algorithm.

KEYWORDS : Point Feature Matching, Detection of Futures, Cluttered Scenes,Computer Vision Systems.

INTRODUCTION

Detection of objects in cluttered scenes is a fundamental challengeth-at has only recently been widely undertaken by computer visionsys-tems. This paper proposes a novel method how to detect aparticular object in cluttered scenes, given a reference imageof the object. This paper presents an algorithm for detecting aspecific object based on finding point correspondences betweenthe reference and the target image. It can detect objects despite ascale change or in-plane rotation. It is also robust to small amountof out-of-plane rotation and occlusion.

When only point correspondence is concerned, point set matching can be formulated as a graph matching problem. State-of-the-art graph matching methods include graduated assignment, spectral methods and semi definite relaxation. Theory of dual decomposition was used to combine several optimization techniques to solve the graph matching problem in. Point set matching was formulated as an embedding problem.

For such time-critical applications, point feature matching is anat-tractive solution because new objects can be easily learned online,in contrast to statistical-learning techniques that require manytraining samples. Our approach is related to recent and efficientmatching methods and more particularly to, which consider onlyimages and their gradients to detect objects.

The method of object detection works best for objects that exhibit-non-repeating texture patterns, which give rise to unique feature-matches. This technique is not likely to work well for uniformlycolor-edobjects, or for objects containing repeating patterns. Theproposed algorithm is designed for detecting a specific object,for example, the elephant in the reference image, rather than anyelephant. For detect-ing objects of a particular category, such aspeople or faces etc.

ALGORITHM IMPLEMENTATION

The fig. 1 shows the basic steps involved in the proposed algorith-mimplementation.

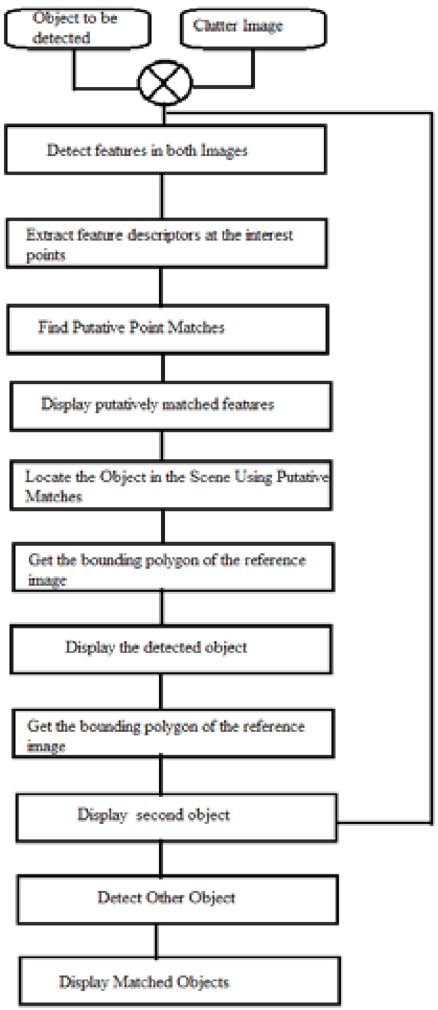


Figure 1: Algorithm

We study the problem of object detection in natural images using shape. Visual objects can be represented at a variety of levels from signal (filter responses) to symbol (object parts). Our approach focuses on representation of the Feature that is closer to the symbol level, which would allow abstract geometrical reasoning of the object. Feature description is invariant to color, texture, and brightness changes, which could enable significant reduction in the number of training examples, and increase of accuracy of the detection. Object detection using Feature alone is not an easy task. Most shape matching algorithms are susceptible to accidental alignment: hallucinating objects in background clutter. To avoid foreground (surface marking) and background clutter, Feature descriptors are often computed within a window of limited spatial extent. Local window features are discriminative enough for detecting objects such as faces, cars and bicycles.

Algorithamic steps :

1.Read the reference image & target image.
2.Detect Feature Points in both Images, Visualize the strongest feature points found in the target image.(Go to Step 1 of abcd)
3.Extract feature descriptors at the interest points in both images. (Go to Step 1 of xyz)
4.Find Putative Point Matches, Match the features using their descriptors. (Go to Step 1 of Ftrmtch & fundamentalff)
5.Display putatively matched features.
6.Locate the Object in the Scene Using Putative Matches Display the matching point pairs.
7.Get the bounding polygon of the reference image.
8.Display the detected object.
9.Get the bounding polygon of the reference image.
10.Detect a second object by using the same steps as before.
11.Repeat Steps 1-6
12.Display Both Objects

SYSTEM BLOCK DAIGRAM

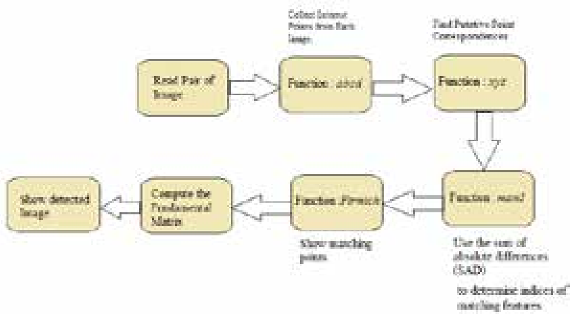


Figure 2: System Block Daigram

RESULTS & DISCUSSION

In Our Project, our main motive is to detect the object which has some degree of rotation. Means not exactly same in clutter image. In this example we rotate the image of book . our task is to detect the book in clutter image.

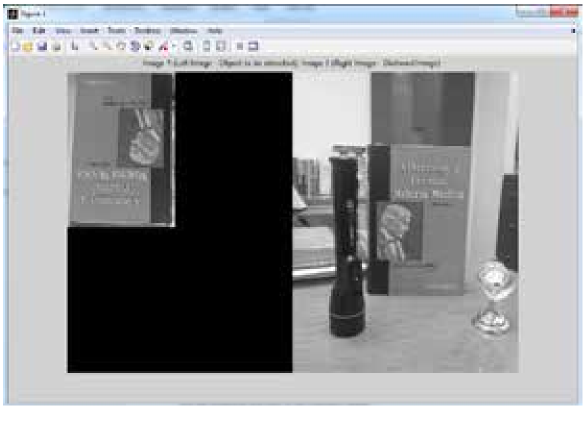
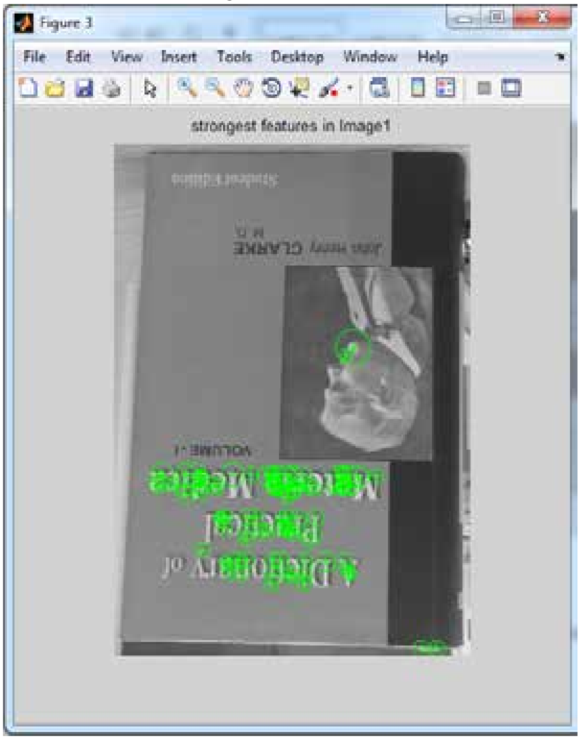
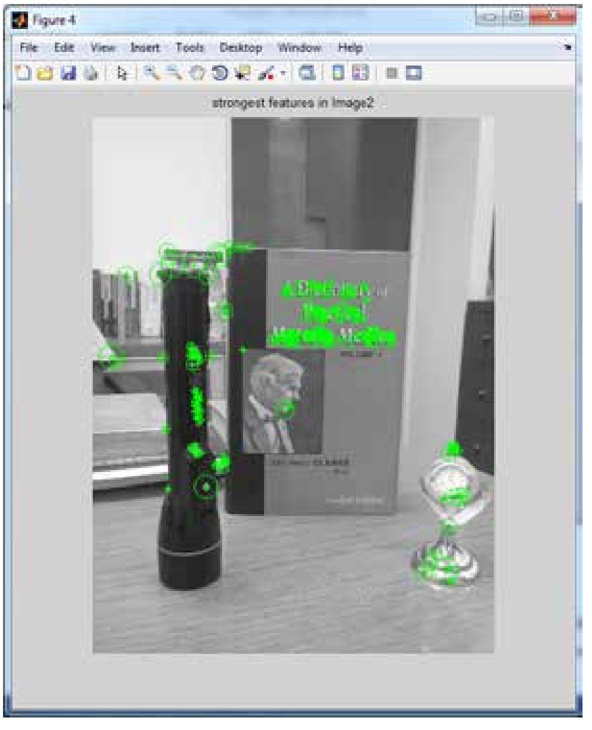


Figure3 : read Reference and Target Image

Detect Feature Points in both Images, Visualize the strongest feature points found in the target image. Here we Find Putative Point Matches, Match the features using their descriptors in both of Images i.e. Form Object to be detected & Cluttered Image. After finding putatively matched points we Display putatively matched features. We mark the strongly selected feature point using polygons. Here we define the number of strongest feature to be selected.





Locate the Object in the Scene Using Putative Matches Display the matching point pairs.

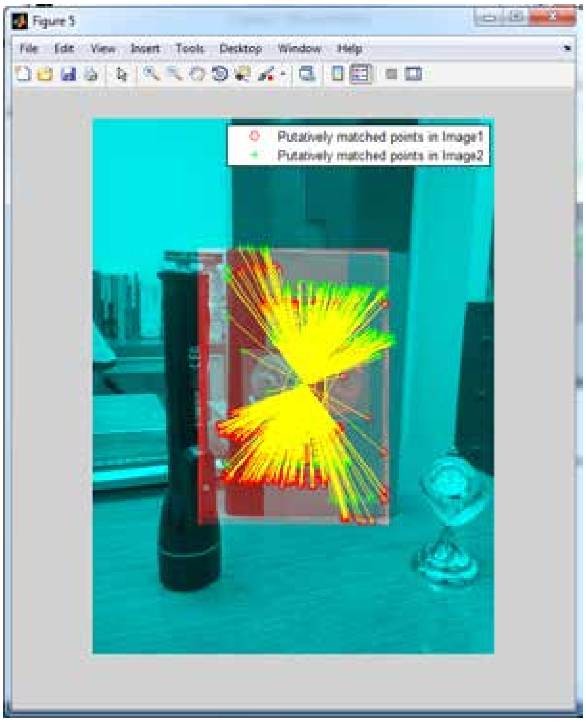


Figure 4 : Display the detected object.

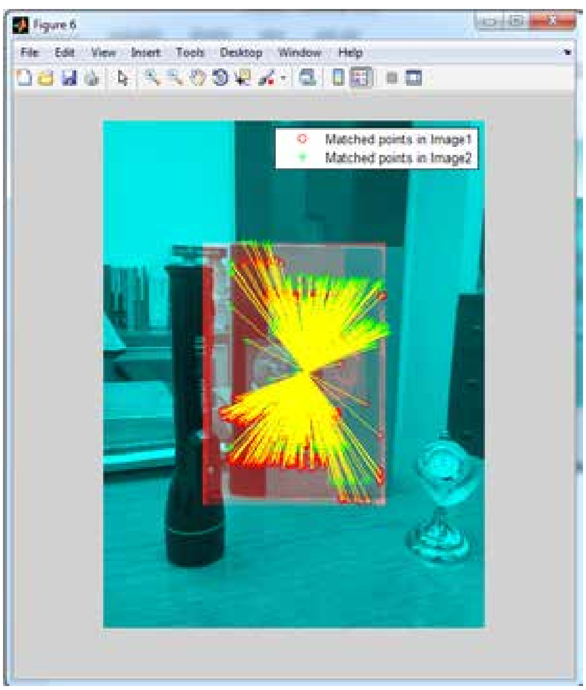


Figure 5: Final Output

CONCLUSIONS

We study & observe different kind of algorithm for clutter image matching.

This method of object detection works best for objects that exhibit non-repeating texture patterns, which give rise to unique feature matches. This technique is not likely to work well for uniformly-colored objects, or for objects containing repeating patterns.

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