TARGET OBJECT DETECTION

**Project Description:**

Our Project is Detection of the target object in the query/scene image based on the reference image of the object we give as a input based on Feature Extraction. Feature points are used for object detection in the given input image by detecting a set of features in a reference image and matching features between the reference image and the input image.

**Methodology:**

1. The objects to be detected from that query image are first taken as input training images such as book,stapler,toys,etc

2. Convert the input images to grayscale using grayscale conversion.

3. Detecting the Features using the SURF features detection which implements the SURF(Speeded- Up Robust Features) algorithm for the blob features detection.

4. Then the features are extracted based on the SURFPoints which are obtained by the SURF features detection.

5. After Extracting features of that target object & query image. Then match the features of both the images based on the extracted features of both the images.

6. Now in some cases, there are matched points among the two images which are not actually belong to the object are called as outlier points.

7. These outlier points should be excluded and only Inlier points are considered for the detection of target object.

8. At final stage by comparing all features of that target object from query image, the target object is detected in query image.

**Sample Results:**

|  |  |  |
| --- | --- | --- |
|  | **GROUND TRUTH** | **ACTUAL RESULT** |
| Scene 1 | Detect Lost Book | Detected |
| Scene 2 | Detect a toy | Detected |
| Scene 3 | Detect Nothing | Detected non target object |
| Scene 4 | Detect Flower Vase | Detected |
| Scene 5 | Detect an Object | Detected non target object |
| Scene 6 | Detect Laptop | Detected |
| Scene 7 | Detect Mouse | Detected |
| Scene 8 | Detect 4 tennis balls | Detected only one ball |
| Scene 9 | Detect Text Book | Detected |
| Scene 10 | Detect object | Detected nothing |
| Scene 11 | Detect a stapler | Detected |
| Scene 12 | Detect cropped image | Detected |
| Scene 13 | Detect TV | Detected |
| Scene 14 | Detect object | Detected |

**Analysis:**

|  |  |  |
| --- | --- | --- |
| **Actual Result(Total)** | **Detected** | **Not Detected** |
| Detect Object(25) | 20 | 5 |
| Detected Nothing(15) | 12 | 3 |

Accuacy is 80% from our analysis.

**Challenges Faced:**

While working on this project we have mainly faced the below difficulties

1. In case there are multiple objects of same reference image type,then this algorithm works only for detecting single object in the query image.

**Reference :**

We refered a research journal paper for project.Link is given below

https://pdfs.semanticscholar.org/4f3a/056aa1c42344d5eb26beb704077ad837840f.pdf