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## RESEARCH ARTICLE

### Similarity Identification Technique for Absolute Matching of Images with Feature Specifications.

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#### Abstract

Image Matching is the method for identifying proper symmetric image from the large scale of data sets. Mainly, Principle Component Analysis based approach is used to determine the similarity over the features of corresponding eigen faces. Two steps are utilizing for getting the resultant image as matched data. In the first step, training of the system is carried out and next step is dedicated to test image for matching with references. After determining matched image, features matching is carried out to find out extreme points. Absolute matched image is generated with the support of extreme points.

#### Introduction:-

Different kinds of identification techniques are introduced for improving the performance. But the feature consideration as well as matching factors are not chosen and the matching elements are not utilized for recreating the identical one with the support of features. Throughout the matching process each extreme points are essential one for getting perfect output. So, not only the similarity or matching identification but also feature matching with proof is considered. Proof is utilizing for recreating the exact one without errors. Which is supportive for underlining the whole process as effective one. When compare with older methods, these kinds of recreating with the proof factors are not possible due to imperfections and delay of whole process. Extreme exact points are considered for absolute matching of each specimen. Which is used to give more clarification of recreation of original data in the different format, without the violation of similarity over identity.

#### Related Works:-

A novel object representation can be carried out for face recognition with the support of Local Gabor Binary Pattern Histogram sequence. In which, histogram of the image can be found out systematically to determine the original image is symmetric to test image[1]. Gabor feature based classification is used for determining the identical features of images. Enhanced fisher linear discriminant model is tracking the recognizing factors from images[2]. Retina modeling based face recognition is supporting the robust identification of real images probability of error is negligible one[6]. Multi Resolution gray scaled based classification is carried out with this method with the support of rotation invariant texture classification in the case of local binary patterns[8]. Distance measurements are carried out in the case of Principle Component Analysis based face recognition system to find out the parametric accuracy and similarity[10]. Comparison of Eigen faces and Fisher faces are carried out for finding out equal one with the support of enhanced Fisher Linear Discriminant model[7]. Comparative study for matching images over localized patterns are considered to determine the face recognition effectively. Perfection of the images are considered throughout the process to reduce the error factors and noise level is reduced to overcome the fault occurrence. But detection is carried out in the certain ranges without the presence of recreation of original[3].

### Methodology:-

Similarity identification technique is useful for identifying similar or identical data images from the set of images. When consider n number of images, from that list one of the suitable pair or choice is selected systematically with the support of PCA algorithm. In which analysis of corresponding training images as well as testing images are carried out. With the support of features the identification is done. Then feature matching process is carried out in systematic manner. Through extracting extreme points, absolute matched image is built up with respect to data set.

### Proposed System:-

In this system, mainly two sections of operations are carried out. Which can be identified from the following block diagram. Mainly training and testing are important key processes. Each of them having important role to generate the resultant. Avoidance of mismatching and data clearances based on the accuracy are carried out to eliminate faulty feature points. Only allow the exact data or image from the references.

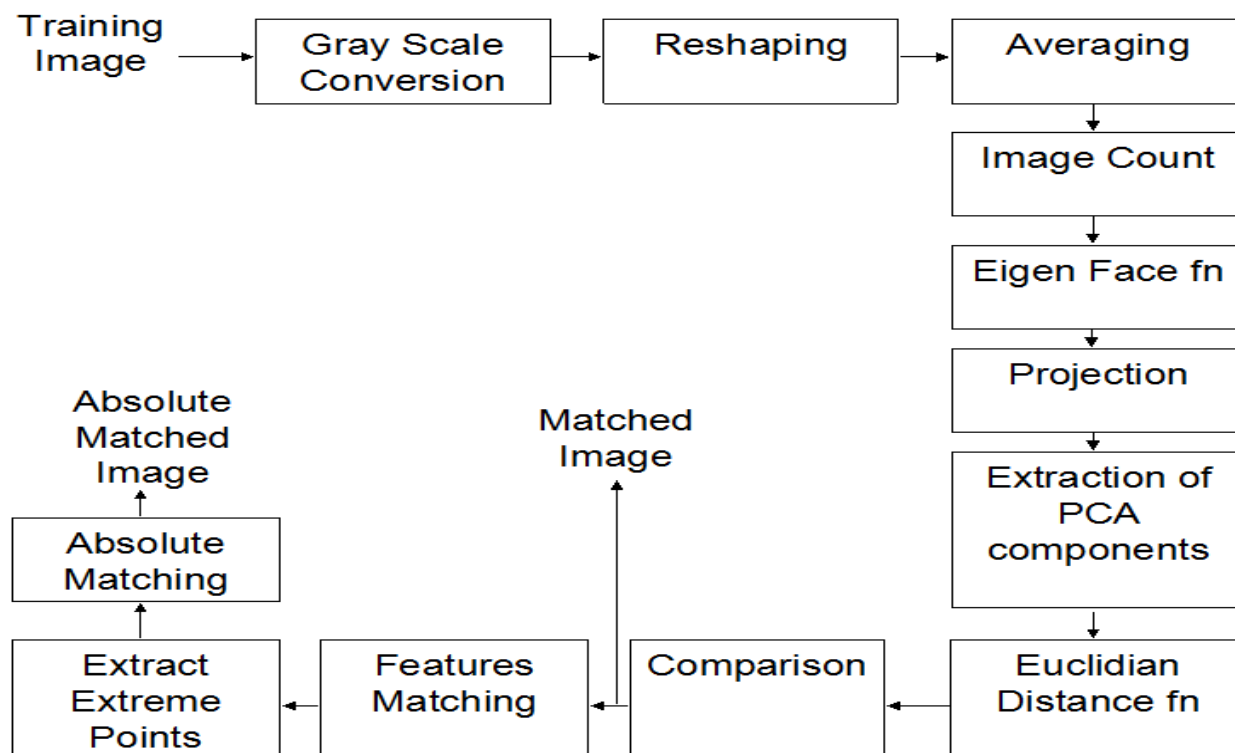


Figure 1: Proposed System

At first, training of the reference images are carried out. Completing the training section, testing of each images are carried out for finding out suitable matching from the dataset. Each and every images having its own characteristics. According these kinds of important factors the classification and identifications are carried out systematically. Each sections are responsible for various functions to reach the target.

### Training Images:-

The first step is the training images. Which are included in the training data set. Certain steps or processes are carried out in the training section. Which are listed out below,

1. Training set data images are giving as input to analysis section.
2. Gray scale conversion is carried out.
3. Reshaping of the images are done.
4. Mean value of each images are found out.

$$\bar{x} = \sum_{i=1}^n \frac{x_i}{n} \quad (1)$$

where,

$\bar{x}$  is the mean,  $x_i$  inputs,  $n$  number of inputs

5.Total number of images are finding out using image count for verification purpose

6.Eigen faces are determined with the support of eigen values as well as eigen vectors.

$$k = \frac{n(\lambda_1 + \lambda_2 + \dots + \lambda_n)}{v} \quad (2)$$

$$v = n(\lambda_1 + \lambda_2 + \dots + \lambda_n) \quad (3)$$

where,

$k$  eigen faces parametric value,  $v$  is the eigen vector,  $n$  number of elements,  $\lambda_n$  is the eigen value

7.Projection of each eigen faces with the support of mean value is determined.

8.Extraction of PCA components are determined through systematic analysis.

Covariance Matrix,  $S = TT^T$

$$Sv_i = TT^T v_i = \lambda_i v_i \quad (5)$$

$$T^T T u_i = \lambda_i u_i \quad (6)$$

where,

$T$  is the trained image,  $v_i$  is image vector,  $\lambda_i$  is the eigen value,  $u_i$  image vector of feature of PCA.

### Testing Images:-

The second step in the whole process is testing images. Which is useful step to identify the matched image. Also, which is suitable for generating matched features and remaining processes.

- 1.Here, similar as in the training images all the eight steps are carried out atfirst.
- 2.Euclidean distance determination is carried out from the testing image.
- 3.Consider Euclidean distance of training image with respect to testing image.
- 4.Comparison of Euclidean distance with the essential features and parameters are considered.
- 5.Determine the matched image from corresponding dataset.

$$\text{Euclidean distance, } d(p,q) = d(q,p) = \sqrt{(q_1 - p_1)^2 + (q_2 - p_2)^2 + \dots + (q_n - p_n)^2} \quad (7)$$

$$= \sum_{i=1}^n (q_i - p_i)^2 \quad (8)$$

where,

$q_i$  &  $p_i$  are the feature points,  $n$  number of points are utilized for finding euclidean distance.

### Absolute Matched Image:-

Third step of this process. Which is also the final step. Regenerating original image with the support of extreme matched points and matched features are carried out as a proof of whole process. Important steps of this section is given below.

1. Extracting important valid points with index pairs
2. Detect the SURF points to improve the performance.
3. Finding out vector points and matched points.
4. Check errors with inlier points
5. Threshold value of the feature points are considered. Which is also the averaging of extreme points or feature points. Thus reconstruct test image as absolute matched image for whole process proof.

Here, Threshold value is considered as  $T_i > I_{ij}$ ; which is the condition of the threshold value of the corresponding image. where,  $I_{ij}$  is the image of the order of  $i \times j$ .

### Result and Discussion:-

The processing of the testing image is carried out in the systematic manner. At first, mainly training of the images are carried out for removing faults or errors and this method is used to improve the performance of whole system. Which can be identified through the resultants.

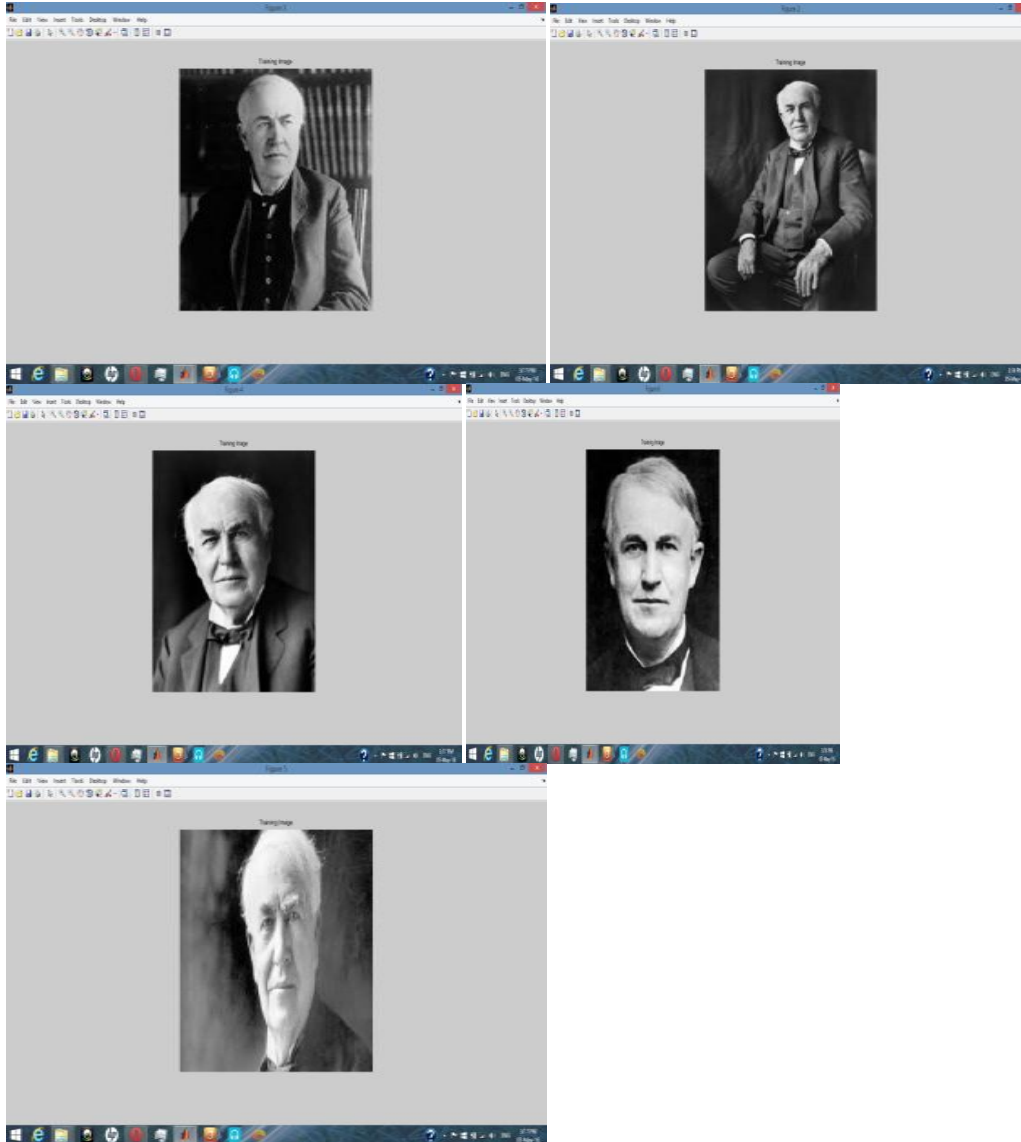
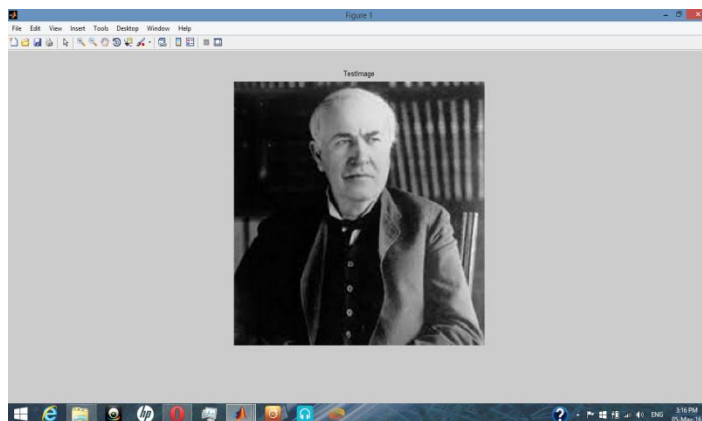


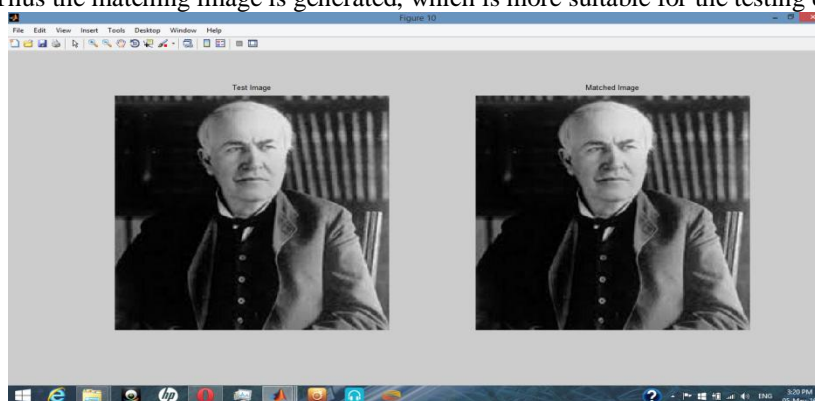
Figure 2 : Training Images

The above mentioned set of diagrams (figure 2) are training images. Which are used to train the corresponding system. According the features are presented over the images, similarities are built up and the datasets for reference to generate matched image identification according the input as test image. Training is normally studying or teaching the corresponding system to make right decision with perfect precision.



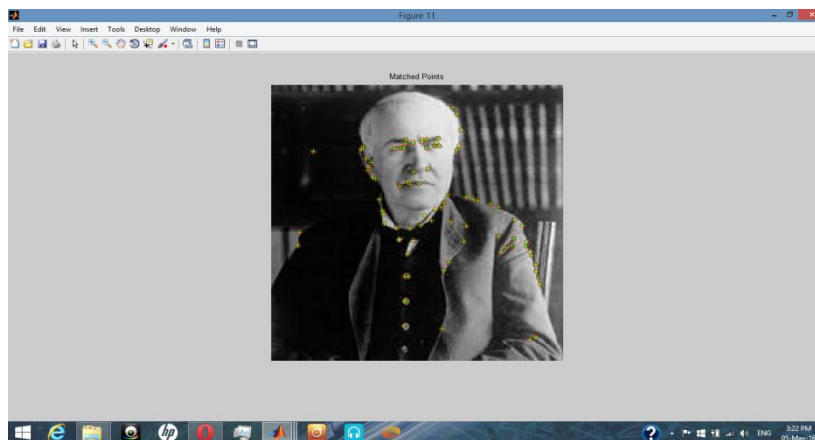
**Figure 3 : Test Image**

In the figure 3, the input image or test image is given. According to this image the proper choice is selected from the reference data set. Thus the matching image is generated, which is more suitable for the testing data.



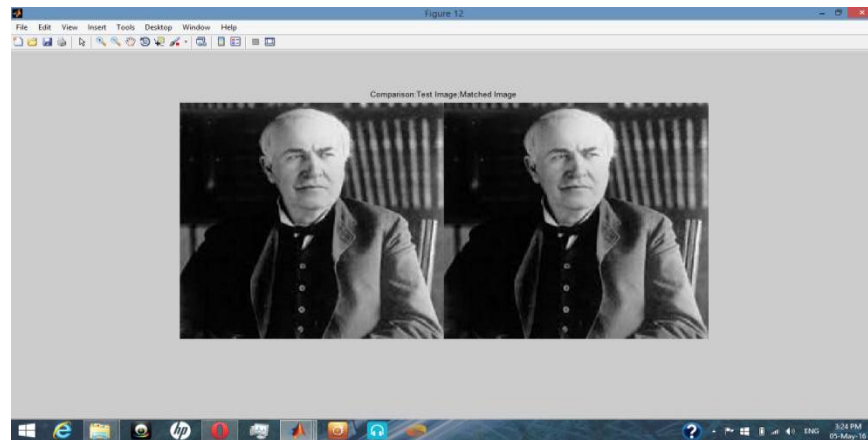
**Figure 4 : Test and Matched Images**

After processing both the training images and test image, proper similarity identification is carried out to match the images. Other images are discarded completely. Similarity in the images can be done successfully with the support of effective training process. Test image and matched image are in the figure 4.



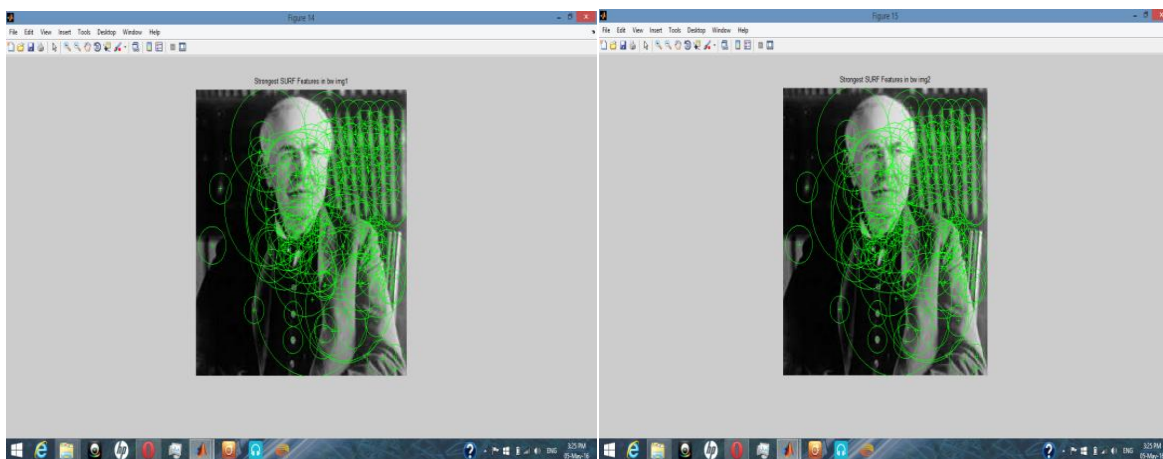
**Figure 5 : Matched Points**

In figure 5, matched points are displayed. Both of the test image and matched image having certain matching points. Which are displayed in the above figure.



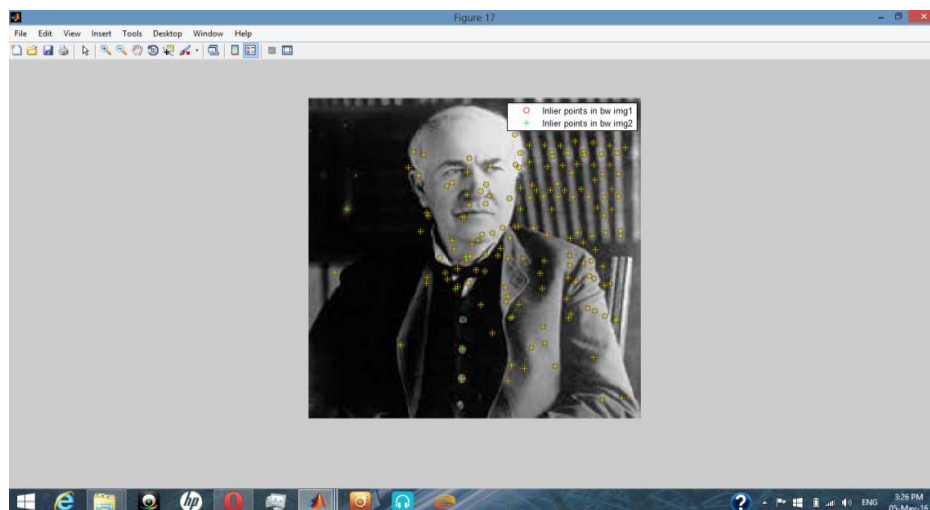
**Figure 6 :** Comparison of Test and matched images

Comparison of the Test and matched images are mentioning by the figure 6. Which is the initial step to build up Absolute matched image, which having all the features of both the images.



**Figure 7 :** Strongest SURF Features in test and matched images

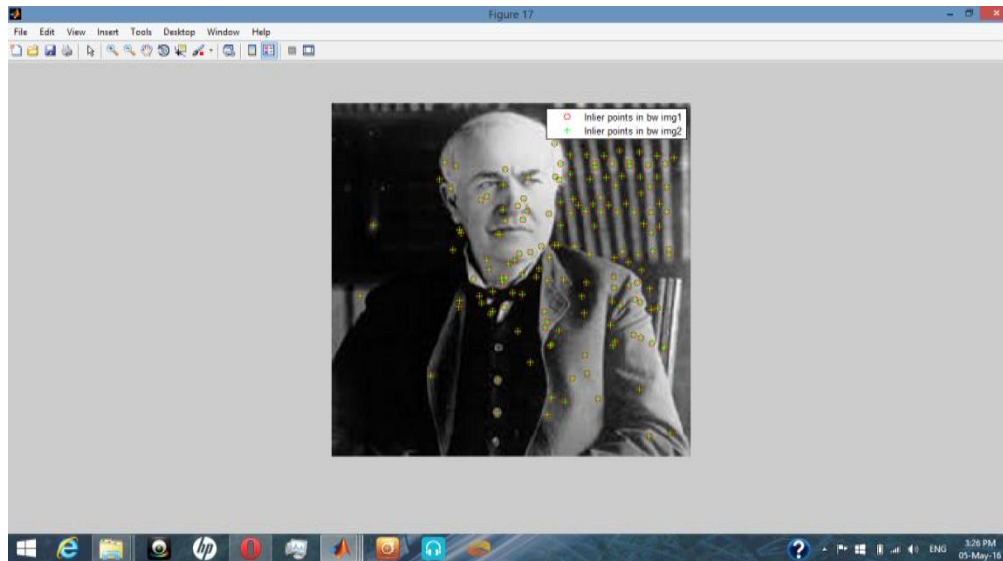
In the above figure 7, strongest SURF features of both the test and matched images are given. Which is the important step to improve the precision in the regenerating absolute image. Which having more similar features.



**Figure 8 :** Extremely Matched Points

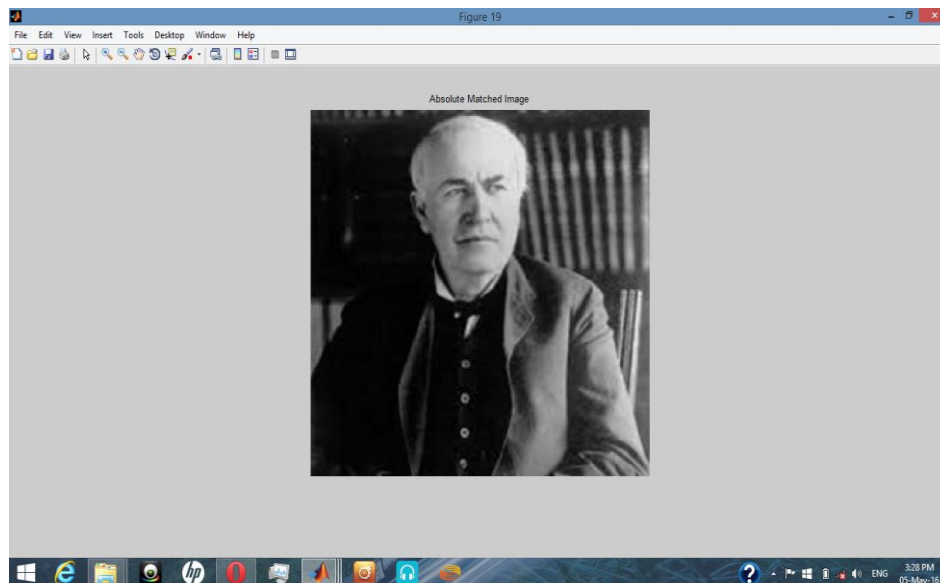


Extremely matched points in both the test image and matched images are plotted in the figure 8. Which is used to identify the similarity in the large scale to improve the data set by reducing total size and removal of errors in effective manner.



**Figure 9 : Inlier Points in Test and Matched images**

Inlier points in the test image and matched datas are plotted in the figure 9. Which is absolute precision value over both the images to remove every kinds of faults or errors. With the support this dataset the resultant is generated .



**Figure 10 : Absolute Matched Image**

Absolute matched image is generated with the support of matched points, strongest SURF points, Inlier points and PCA features etc. Which is created through similar feature points over both the test as well as matched image. Which is displayed in the above figure 10.

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