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Implementation of Real-time Face Recognition System based on SURF Algorithm

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Abstract— Main objective of this paper is to represent an approach for recognized faces of human being based on SURF algorithm. This approach concerned with registering a set of human faces to a face database, matching stored faces against real time faces . Matlab programming is implemented for this approach. KLT algorithm is used for detect faces as well as create face database. Surf algorithm is implemented for recognize detected faces.

Keywords- *KLT Algorithm, Surf Algorithm, Face Detection, Face Recognition*

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I. INTRODUCTION

Human face detection and recognition is a major topic for modern day researchers. It is very important in many computer fields like criminal identification, access and security, E- banking, Online shopping site, Net banking etc. Real time face detection and recognition is not a simple problem. Many approaches [1] have been already implemented like template matching, neural network, MRC etc., Different algorithm have been used over the past few years. These algorithms have own some disadvantages. The techniques used in our paper are the most effective among those. The algorithms applied in this paper for face detecting and tracking is KLT algorithm and SURF algorithm is applied for calculating matching percentage of different features points for recognition process.

A. ***KLT algorithm:***

KLT algorithm was proposed by Tomasi-Kande and Lucas in 1982[2].It is most popular method for feature tracking in computer vision.KLT algorithm is used for detecting facial features points for tracking the required points.[3].

In my research work I use KLT algorithm for detecting and tracking faces of bank customers at the time of registration and login process in a continuously running video frame using a real time web camera.

The basic idea of KLT algorithm can be fall into three assumptions [4].

Brightness consistency: A pixel of an object in an image does not change in appearance from frame to frame when moving. So we can say that a gray scale image, brightness of any object does not change when tracking frame to frame.

Small movement: Motion of an image of surface patch changes very slowly in time. In this point of view we can observe the objects in an image do not move much from frame to frame.

Special coherent: Adjacent points or nearest points in a picture belongs to the same surface have similar motion and project to nearest points on the image plane.

B. ***SURF algorithm:***

SURF can be used as local object detector and descriptor that can be used to extract the key points from both database images and test images for image registration and recognition purpose. H bay invents SURF descriptor in 2008 .It is a scale and in-plane invariant features. It has two stages .One is interest point detector and other is interest point descriptor. SURF features are invariant of shifting rotation and scaling and partially invariant to illumination and affine transformation. Hessian blob detector is used to detect the intersect point for computing three integer operations for a pre-computed integral image. As a descriptor SURF uses first order Haar wavelet in x,y co-ordinate .SURF uses 64 dimension to reduce the time cost for feature matching and computation.

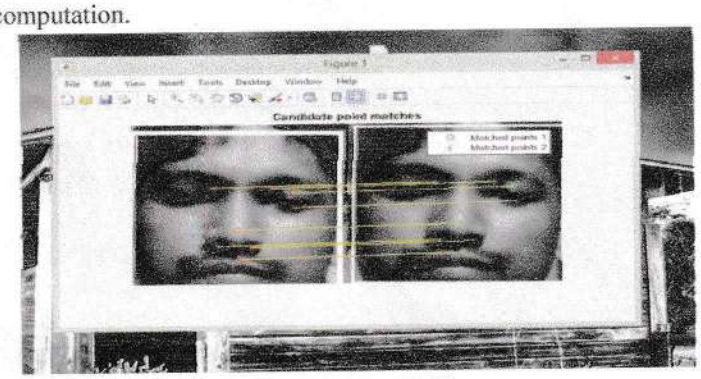

Fig 1 shows SURF Features

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অসমত প্রচলিত লোক-পৰিবেশ্যকলা ওজাপালি ঃ এক চমু পর্যালোচনা

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লোকসংস্কৃতিৰ ব্যাপক পৰিসৰৰ ভিতৰুৱা এটা অন্যতম প্রধান ভাগ হ'ল লোক-পৰিবেশ্যকলা। লোকনৃত্য, লোকনাট আৰু লোকসংগীত এই তিনিটা লোক-পৰিবেশ্যকলাৰ ভিতৰুৱা অংগ। অসমত প্রচলিত বিভিন্ন লোক-পৰিবেশ্যকলাসমূহৰ ভিতৰত ওজাপালি অনুষ্ঠানৰ এক স্বকীয় উপস্থিতি দৃষ্টিগোচৰ হয়। নৃত্য, নাট আৰু সংগীতৰ উমৈহতীয়া সংযোগত সৃষ্ট ওজাপালি অনুষ্ঠানে অসমত জীৱন্ত লোক-পৰিবেশ্যকলাৰ মর্যদা লাভ কৰিছে। আমাৰ এই গৱেষণাপত্রখনত প্রধানকৈ ওজাপালি অনুষ্ঠান পৰিবেশনৰ পৰম্পৰাগত পদ্ধতি, ওজাপালিৰ পোছাক আৰু অলংকাৰ আৰু অসমত প্রচলিত ওজাপালি অনুষ্ঠানৰ শ্রেণীবিভাজনৰ বিষয়ে থূলমূলকৈ আলোচনা কৰা প্রয়াস কৰা হ'ব।

সূচক শব্দ ঃ লোকসংস্কৃতি, লোক-পৰিবেশ্যকলা, ওজাপালি, পালি, দাইনাপালি