

# **PROPOSAL**

## **Face Detection & Recognition System**

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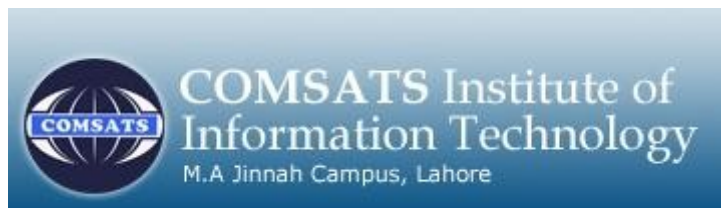
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## **Preface**

This proposal for Face Detection & Recognition System is partial fulfillment of the requirements to graduate in honors degree in Bachelor of Science (Computer Sciences).

This proposal provides the scope and context of the project to be undertaken. It details the intended user group and the value that the system will have to them. It also provides a schedule for the completion of the project, including a list of all the deliverables and presentations required.

The intended viewers of this document are the experience faculty of the department so that they can determine whether the project should be approved as proposed, approved with modifications.

It is expected that this proposal will be presented to the Head of Department of Computer Science Department and Head of Project Approval Committee before project is formally started.

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# Introduction

## Background and History:

Face recognition rises from the moment that machine started to become more and more "intelligent" and had the advance of fill in, correct or help the lack of human abilities and senses.

The subject of face recognition is as old as computer vision and both because of the practical importance of the topic and theoretical interest from cognitive science. Face recognition is not the only method of recognizing other people. Even humans between each other use senses in order to recognise others. Machines have a wider range for recognition purposes, which use thinks such as fingerprints, or iris scans. Despite the fact that these methods of identification can be more accurate, face recognition has always remains a major focus of research because of its non-invasive nature and because it is people's primary method of person identification.

Since the start of that field of technology there were two main approaches. The two main approaches to face recognition are

- geometrical approach
- Pictorial approach.

The geometrical approach uses the spatial configuration of facial features. That means that the main geometrical features of the face such as the eyes, nose and mouth are first located and then faces are classified on the basis of various geometrical distances and angles between features. On the other hand, the pictorial approach uses templates of the facial features. That method is using the templates of the major facial features and entire face to perform recognition on frontal views of faces. Many of the projects that where based on those two approaches have some common extensions that handle different poses backgrounds. Apart from these two techniques we have other recent template-based approaches, which form templates from the image gradient, and the principal component analysis approach, which can be read as a sub-optimal template approach. Finally we have the deformable template approach that combines elements of both the pictorial and feature geometry approaches and has been applied to faces at varying pose and expression.

## Problem Statement:

Considering of an image representing a frame taken from video stream, automatic face recognition is a particularly complex task that involves detection and location of faces in a cluttered background followed by normalization and recognition. The human face is a very challenging pattern to detect and recognize, because while its anatomy is rigid enough so that all faces have the same structure, at the same time there are a lot of environmental and personal factors affecting facial appearance. The main problem of face recognition is large variability of the recorded images due to pose, illumination conditions, facial expressions, use of cosmetics, different hairstyle, presence of glasses, beard, etc. Images of the same individual taken at different times, may sometimes exhibit more variability due to the aforementioned factors (intrapersonal variability), than images of different individuals due to gender, race, age and individual variations (extra personal variability). One way of coping with intrapersonal variations is including in the training set images with such variations. And while this is a good practice for variations such as facial expressions, use of cosmetics and presence of glasses or beard, it may not be successful in case of illumination or pose variations.

Read more: [Face Recognition - Face Detection, Global Approaches for, Feature Based Techniques,](#)

## **Scope of new System:**

Computational models of face recognition, in particular are interesting because they can contribute not only to theoretical insights but also to practical applications. Computers that recognize faces could be applied to avoid variety of problems, including criminal identification, security systems, images and film processing, and human-computer interaction. For example, the ability to model a particular face and distinguish it from a large number of stored face models would make it possible to vastly improve criminal identification. Even the ability to merely detect faces, as opposed to recognizing them, can be important. Detecting faces in photographs, for instance, is an important problem in automating color film development; since the effect of many enhancement and noise detection techniques depends on the picture content (example faces should not be tinted green, while perhaps grass should).

Previous version of this system was based on skin analysis using 2D camera, despite a fact newer version will be capitalizing the entire previous region while using feature based analysis and 3D IR high definition camera

## **Feasibility Assessments**

### **Benefits**

3D and IR technology is used.

1. Efficient result in even in low light.
2. Efficiency

### **Project Cost**

We hereby declare, we will try to overcome the problems of previous version, by making it more accurate and precise.

## **Required Hardware and Software**

### **Hardware**

#### **Recommended Requirements**

Processing:	Core 2 Duo with processing speed 2.0 GHz
Memory:	2GB RAM
	50 GB Hard Disk

## **1.1 Software**

Our project is based on computer vision concepts. We will try to acquire an image, broadcast a video stream, manipulate a database, and finally, the detection/recognition phase, all in relation with their possible C#/.NET and MATLAB solutions[1]

- MATLAB
- C# using Visual Studio 2008
- MS SQL Server

## **Deliverables and Development requirements:**

Following components will be delivered after the completion of the project to the project coordinator.

- Extraction of a human from a live video stream
- 3D to 2D conversion of the image
- Detection of image(matching the image with the images in the database )
- Recognition
- Detailed documentation

## **Schedule Feasibility**

### **Time-Frame.**

We have divided our Project in following phases:

### **Requirement Elicitation**

In this phase we will gather the complete requirements, to have better understanding of the project.

## Analysis phase

In this phase of the project we will gather the detailed information about Face Detection & Recognition System transformation from 3D to 2D image, how it works, and is it compatible with our project and operating system we are using. Complete analysis phase can take 2 months. As our work is completely depended on Research Papers and it is not easy to read and understand them.

## Project Configuration

Our project is mainly depended on the Research that is done in its field and it is not easy at bachelor level to completely understand them by on.

## Implementation

Coding will start soon after the analysis phase it will take at least 3 months.

## Testing

Testing will be done by the developer side & client side at the end of the final year project, as in our case we are our own clients so we will do it at our own and it involves to

- Look at the project from a micro level
- Include experiments
- Look at system results
- Test each part of the system
- Make sure that design and implementation works
- Identify errors in codes

## Deployment

After Completion of coding and testing of the product, we will deploy the system on our client's Place.

## References

1: FACTA UNIVERSITATIS (NI'S) SER.: ELEC. ENERG. vol. 20, no. 1, April 2007, 93-105