

## CRIMINAL FACE DETECTION SYSTEM

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**Abstract** - Criminal Face Detection project aims to build a automated Criminal Face Detection system by leveraging the human ability to recall minute facial details. Identification of criminals at the scene of a crime can be achieved in many ways like fingerprinting, DNA matching or eye witness accounts. Out of these methods eye witness accounts are preferred because it stands scrutiny in court and it is a cost-effective method. It is possible that witnesses to a crime have seen the criminal though in most cases it may not be possible to completely see the face of the perpetrator. The Criminal Face Detection System will be built of an existing criminal database. Input would be provided in the form of sketch or an image and matched against the existing database and results would be provided. Criminal record generally contains personal information about particular person along with photograph. To identify any Criminal, we need some identification regarding person, which are given by eyewitness. In most cases the quality and resolution of the recorded image segments is poor and hard to identify a face. To overcome this sort of problem we are developing software. Identification can be done in many ways like finger print, eyes, DNA etc. One of the applications is face identification. The face is our primary focus of attention in social inters course playing a major role in conveying identify and emotion. Although the ability to infer intelligence or character from facial appearance is suspect, the human ability to recognize face is remarkable. The human face is a complicated multidimensional visual model and hence it is very difficult to develop a computational model for recognizing it. The paper presents a methodology for recognizing the human face based on the features derived from the image. The proposed methodology is implemented in two stages. The first stage detects the human face in an image using viola

Jones algorithm. In the next stage the detected face in the image is recognized using a fusion of principle.

**Index Terms** – Face Detection System, DNA, Human Face.

### I. INTRODUCTION

Criminal record generally contains personal information about particular person along with photograph. To identify any Criminal, we need some identification regarding person, which are given by eyewitness. In most cases the quality and resolution of the recorded image segments is poor and hard to identify a face. To overcome this sort of problem we are developing software. Identification can be done in many ways like finger print, eyes, DNA etc. One of the applications is face identification. The face is our primary focus of attention in social inters course playing a major role in conveying identify and emotion. Although the ability to infer intelligence or character from facial appearance is suspect, the human ability to recognize face is remarkable. This project is aimed to identify the criminals in any investigation department. Here the technique is we already store some images of the criminals in our database along with his details and that images are segmented into many slices say eyes, hairs, lips, nose, etc. These images are again stored in another database record so to identify any criminals; eyewitnesses will see the images or slices that appear on the screen by using it we develop the face, which may or may not be matched with our images. If any image is matched up to 99% then we predict that he is only the criminal. Thus using this project, it provides a very friendly environment for both operator and eyewitness to easily design any face can identify criminals very easy.

## II. SYSTEM DEVELOPMENT

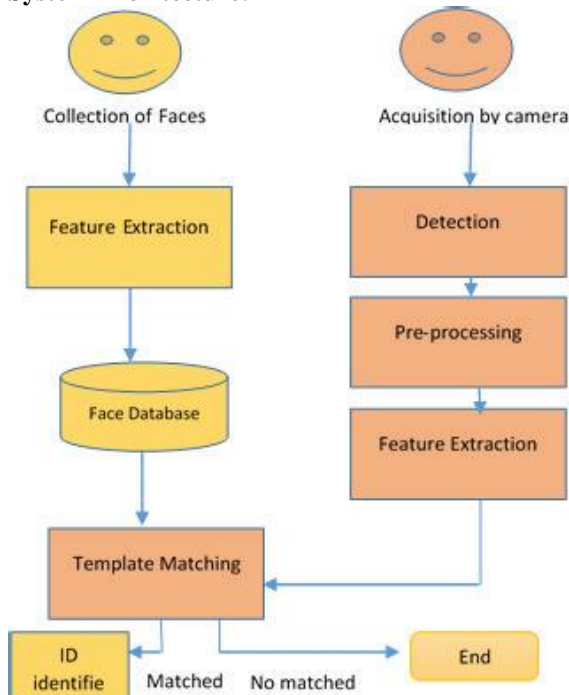
### Drawbacks of existing system:

- This system is manual system only.
- It is manual process.
- This process is very slow to give the result.
- It is very critical to find the criminal images.

### Advantages of proposed system:

- Very fast and accurate.
- No need of any extra manual effort.
- No fever of data loss.
- Just need a little knowledge to operate the system.
- Doesn't require any extra hardware device.
- At last, very easy to find the criminals

### System Architecture:



## III. PROPOSED MODULES

Well-structured designs improve the maintainability of a system. A structured system is one that is developed from the top down and modular, that is, broken down into manageable components. In this project we modularized the system so

that they have minimal effect on each other. This application is designed into five independent modules which take care of different tasks efficiently.

1. User Interface Module.
2. Admin Module.
3. Client Module.
4. Database Operations Module.
5. Splitting and Merging Module.
6. Identify Module

### Module Description:

#### User Interface Module:

Actually every application has one user interface for accessing the entire application. In this application also we are providing one user interface for accessing this application. The user interface designed completely based on the end users. It is provide friendly accessing to the users. This user interface has attractive look and feel. Technically I am using the swings in core java for preparing this user interface.

#### Admin Module:

Create - Assign new user id & password for an employee.  
Delete - Administrator can delete the user id & password of unwanted employee.  
Update - First the details of employees are to be obtained by using user id & password. - After obtaining the original details the updated details are submitted.

#### Client Module:

Login - Employee log in to home page by entering id & password.  
Adding details - Personal details of criminal store in to data base.  
- Images are cropped and saved in database.  
Update process - Enter criminal id and obtain his details  
- Update the details and images of existing criminal  
Delete process - Enter criminal id  
- Delete the details and image of unwanted criminal  
Logout - Logout in to the home page

#### Splitting and Merging Module:

View clippings - View all clips and select the clip shown by eyewitness  
Compare the clippings with images of criminals  
Construction - Construct the face of criminal by clubbing all freezed clippings

#### Database Operations Module:

**ADD MODULE:** The add module is helpful in adding the details of the criminals along with the details of the criminal photo. While adding the details of the criminal, we crop the image of the criminal and store those cropped parts in a separate database.

**DELETE MODULE:** This module deletes the criminal details along with the photo. The operator first submits the criminal id and searches for the availability of the id in the database. If that id is available in the database, then the operator may delete the record of that particular criminal.

**UPDATE MODULE:** The operator first enters the criminal id and searches for the availability of that id. If that id is available in the database, then the details of that criminal are retrieved and the operator can update the details of that criminal and that updated details of the criminal are stored in the database again for future retrieval.

**IDENTIFY MODULE:** The cropped parts of the criminals, along with the criminal Id are viewed by the eyewitness. The eyewitness selects particular cropped part of the criminal and it is freeze by the operator., then complete face of the criminal is constructed and the details of the criminal is retrieved.

#### IV. TESTING METHODS

It is the process of exercising software with the intent of finding and ultimately correcting errors. This fundamental philosophy does not change for web applications, because web based system and applications reside on network and inter-operate with many different operating systems, browsers, hardware platforms and communication protocols. Thus searching for errors is significant challenge for web applications.

Testing issues:

1. Client GUI should be considered.
2. Target environment and platform considerations
3. Distributed database considerations
4. Distributed processing consideration
5. Testing and Methodologies

System testing is the state of implementation, which is aimed at ensuring that the system works accurately and efficiently as expect before live operation, commences. It certifies that the whole set of programs hang together System testing requires a test plan, that consists of several key activities and

steps for run program, string, system and user acceptance testing.

The implementation of newly design package is important in adopting a successful new system 14 Testing is important stage in software development. System test is implementation should be a confirmation that all is correct and an opportunity to show the users that the system works as they expected It accounts the largest percentage of technical effort in software development process.

Testing phase is the development phase that validates the code against the functional specifications. Testing is a vital to the achievement of the system goals. The objective of testing is to discover errors. To fulfill this objective a series of test step such as the unit test, integration test, validation and system test where planned and executed.

#### Unit testing

Here each program is tested individually so any error apply unit is debugged. The sample data are given for the unit testing. The unit test results are recorded for further references. During unit testing the functions of the program unit validation and the limitations are tested. Unit testing is testing changes made in a existing or new program this test is carried out during the programming and each module is found to be working satisfactorily. For example in the registration form after entering all the fields we click the submit button. When submit button is clicked ,all the data in form are validated. Only after validation entries will be added to the database.

Unit testing comprises the set of tests performed by an individual prior to integration of the unit into large system.

The situation is illustrated in as follows

Coding-> Debugging ->Unit testing -> Integration testing

The four categories of test that a programmer will typically perform on a program unit

1. Functional test
2. Performance test
3. Stress Test
4. Structure test

#### Validation Testing

Software validation is achieved through a serious of testes that demonstrate conformity with requirements. Thus the proposed system under consideration has been tested by validation & found to be working satisfactory.



### Output Testing

Asking the user about the format required by them tests the output generated by the system under consideration. It can be done in two ways, One on screen and other on printer format. The output format on the screen is found to be correct as the format designed in system test.

### System Testing

In the system testing the whole system is tested for interface between each modules and program units are tested and recorded. This testing is done with sample data. The securities, communication between interfaces is tested. System testing is actually a series of different tests whose primary purpose is to fully exercise the computer-based system although each test has a different purpose all work to verify that all system elements properly integrated and perform allocate function.

It involves two kinds of activities namely

1. Integrated testing
2. Acceptance testing

### Integrated testing

Integrated testing is a systematic technique for constructing tests to uncover errors associated with interface. Objective is to take unit tested modules and build a program structure that has been dictated by design

### Acceptance testing

Acceptance testing involves planning an execution of a functional test, performance test and stress test to verify that the implemented system satisfies the requirement. The acceptance testing is the final stage of the user the various possibilities of the data are entered and the results are tested.

### Validation testing

Software validation is achieved through a series of test that demonstrates the conformity and requirements. Thus the proposed system under consideration has to be tested by validation and found to be working satisfactorily. For example in customer enters phone number field should contain number otherwise it produces an error message similarly in all the forms the fields are validated.

### Testing results

All the tests should be traceable to customer requirements the focus of testing will shift progressively from programs Exhaustive testing is not possible To be more effective testing should be which has probability of finding errors

The following are the attributes of good test

1. A good test has a probability of finding a errors
2. A good test should be "best of breeds"
3. A good test to neither simple nor too complex

### SYSTEM IMPLEMENTATION:

The first step in developing anything is to state the requirements. This applies just as much to leading edge research as to simple programs and to personal programs, as well as to large team efforts. Being vague about your objective only postpones decisions to a later stage where changes are much more costly.

The problem statement should state what is to be done and not how it is to be done. It should be a statement of needs, not a proposal for a solution. A user manual for the desired system is a good problem statement. The requestor should indicate which features are mandatory and which are optional, to avoid overly constraining design decisions. The requestor should avoid describing system internals, as this restricts implementation flexibility. Performance specifications and protocols for interaction with external systems are legitimate requirements. Software engineering standards, such as modular construction, design for test ability, and provision for future extensions, are also proper.

Many problems statements, from individuals, companies, and government agencies, mixture requirements with design decisions. There may sometimes be a compelling reason to require a particular computer or language; there is rarely justification to specify the use of a particular algorithm. The analyst must separate the true requirements from design and implementation decisions disguised as requirements. The analyst should challenge such pseudo requirements, as they restrict flexibility. There may be politics or organizational reasons for requirements, but at least the analyst should recognize that these externally imposed design decisions are not essential features of the problem domain.

A problem statement may have more or less detail. A requirement for a conventional product, such as a payroll program or a billing system, may have considerable detail. A requirement for a research effort in a new area may lack many details, but presumably the research has some objective, which should be clearly stated.

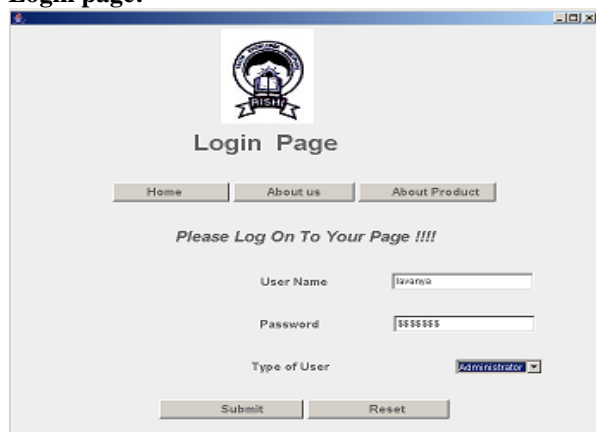
Most problem statements are ambiguous, incomplete, or even inconsistent. Some requirements are just plain wrong. Some requirements, although precisely stated, have unpleasant consequences on the system behavior or impose unreasonable implementation costs. Some requirements seem reasonable at first but do not work out as well as the request or thought.

The problem statement is just a starting point for understanding the problem, not an immutable document. The purpose of the subsequent analysis is to fully understand the problem and its implications. There is no reasons to expect that a problem statement prepared without a fully analysis will be correct.

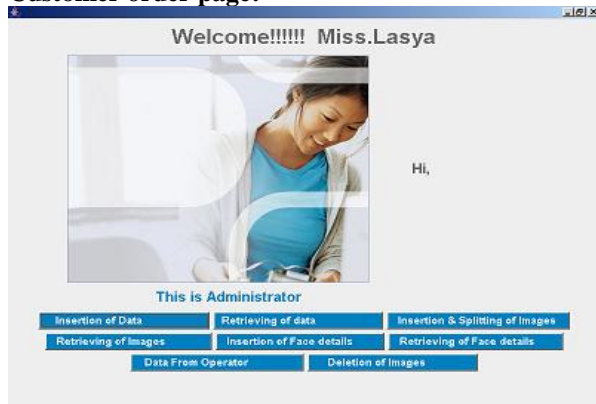
The analyst must work with the requestor to refine the requirements so they represent the requestor's true intent. This involves challenging the requirements and probing for missing information. The psychological, organizational, and political considerations of doing this are beyond the scope of this book, except for the following piece of advice: If you do exactly what the customer asked for, but the result does not meet the customer's real needs, you will probably be blamed anyway.

## V. EXPERIMENTAL RESULTS

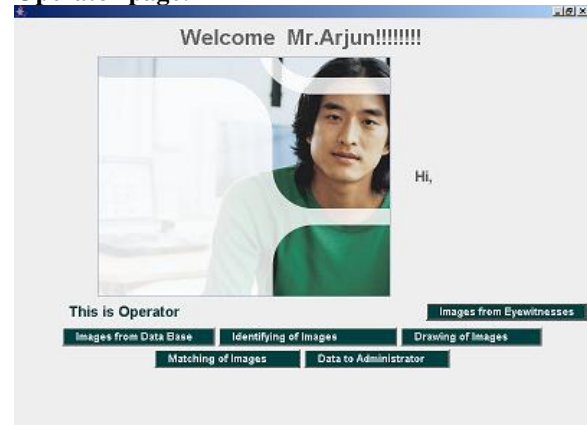
**Login page:**



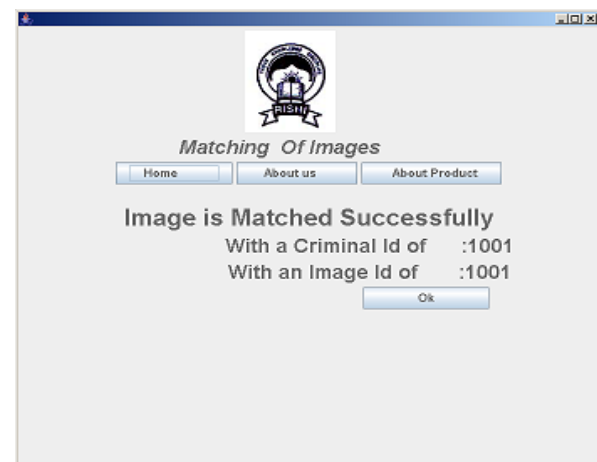
**Customer order page:**



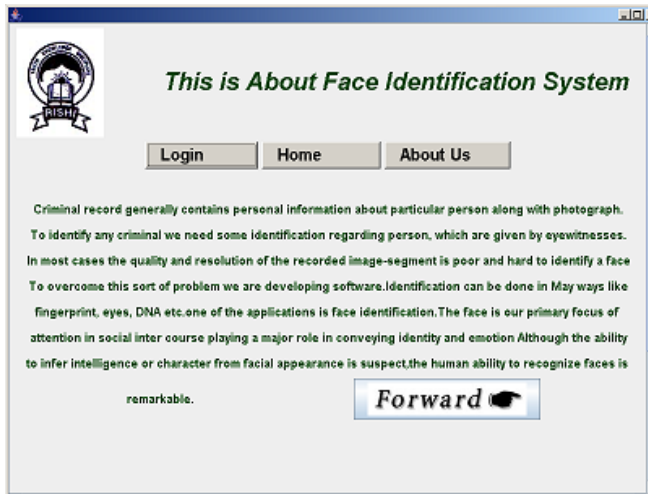
**Operator page:**



**Image Matching:**



## About:



system can be implemented. It is implemented and gone through all validation. All phases of development were conceived using methodologies. User with little training can get the required report. The software executes successfully by fulfilling the objectives of the project. Further extensions to this system can be made required with minor modifications.

## FUTURE ENHANCEMENT

The Future enhancements of this project include the following: The criminal photos may be of any size. By selecting any one cropped part of the criminal, we can get the full image of the criminals along with details. New face constructed by different cropped parts can be saved.

## Image Spilted:



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## VI. CONCLUSION

The "Criminal Face Identification System" has been developed to satisfy all proposed requirements. The process is maintained simpler and easier. This system is highly scalable and user-friendly. Almost all the system objectives have been met. The system have been tested under all criteria. The system minimizes all the problems arising in the existing manual system and it eliminates the human errors to zero level. The design of the database is flexible ensuring that the