Criminal Detection

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Abstract— **It is been observed that it is difficult to solve a case just because the human body parameters are not clear or the image is not clear. The experts are been called and asked to identify the two images whether they are same or different or to estimate about the Body Mass Index. It has observed that the image quality of CCTV is not clear and too poor to identify so all these estimations can be wrong or right no doubt but making a sketch from an uncleared image is difficult so to overcome with these problems we have come up with a software that will calculate the Body parameters (height, weight and Body Mass Index (BMI)).**

I. INTRODUCTION

The main objective of the project is that will identify the human face and Body Mass Index in less time and will also enhance the image and give the true results. Since it becomes too late to punish the culprit and the SID or Police are blamed for not doing anything and even after the culprit is found the punishment is just to be for years behind the bars that's it. So as to punish soon we have designed this software. It is to less the burden and time of the SID that they put on recognition. It is just one sitting work after the software is developed, there's no need to call any expert and take help.

II. USERS OF THE SOFTWARE

The solution should help the SID Department with the Body Mass Index of Human and the clear image of raw image. Technology that can help address the issue MATLAB for Image Processing. Desired solution: The solution should focus on the use of image processing tools.

III. MODULES OF THE SOFTWARE

1. Image Capture:

The Captured Image will be given as an input to the software.

2. Pre-Processing:

The raw image is been sent to the Pre-Processing block and manual cropping is performed.

3. Processing block

Scaling and Grey Scale is performed on cropped image.

- **Scaling:** In computer graphics , image scaling refers to the resizing of a digital image. In video technology, the enlarging of digital material is known as upscaling or resolution enhancement.

- **Grey Scale:** Grey scale images are distinct from one-bit bi-tonal black-and-white images which, in the context of computer imaging, are images with only two colours: black and white (also called *bi-level* or *binary images*). Grayscale images have different shades of grey in between.

- Then the image is been projected into defined dimensions respectively.
- Height, Weight and BMI(Body Mass Index) of the human is calculated.

4. Image Enhancement:

Image enhancement is the process of improving the quality of the image so that the result is more suitable for display or further image analysis. For example, you can remove noise, sharpen, or brighten an image, making it easier to identify key features of the image.

A. *PHI THEORY*

The Golden ratio is a number found by dividing a line into two parts such that the longer part divided by the smaller part is equal to the whole length divided by the longer part. It is often represented using phi, after the Greek alphabet. It can be represented as an equation as follows:

b = (a + b)/a = 1.6180339887498948420 …

- It is used to figure out the body ratio of Human through the available body parts.

- For example, if only the human head is been seen in the image, so according to Phi theory, the head is 1/8 of its height. So, if the human head height through head is 6*3 pixels then its height is 5.7 feet.
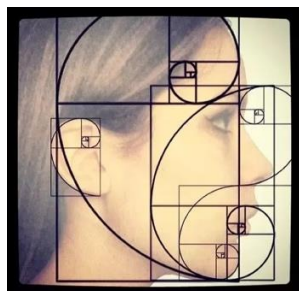

FIG 1: HEAD PROPORTION

Ratio apply – To find the height of a human there are few parameters and these parameters are of Golden ratios/Phi theory those are used as shown below:

SR.NO	HUMAN BODY PARTS	GOLDEN RATIOS
1	The Torso or Trunk	One- fourth of the height
2	The Head	One- eighth of the height
3	The Face	One – tenth of the height
4	The Hand	One- fourth of the height
5	The Foot	One-seventh of the height
6	The Arm	One- fourth of the height

B. THE BROCA INDEX

The origin of Ideal Body Weight

The first person to study about the Ideal Body Weight IBW was Paul Broca (a French Army doctor) who had to establish the ideal body weight for soldiers. In the Broca index, he only used the height in centimeters, and then subtracted it by 100 to get the normal weight. Then, 10% of the normal weight was taken out to get the IBW.

The Broca Index:

1. Men: Ideal Body Weight (kg) = [Height (cm) - 100] - ([Height (cm) - 100] x 10%)

2. Women: Ideal Body Weight (kg) = [Height (cm) - 100] + ([Height (cm) - 100] x 15%)

IBW = Ideal Body Weight

Sr. No	Body Part	Men	Women
1	Trunk	48.3%	50.8%
2	Thigh	10.5%	8.3%
3	Head and Neck	7.1%	9.4%
4	Lower Leg	4.5%	5.5%

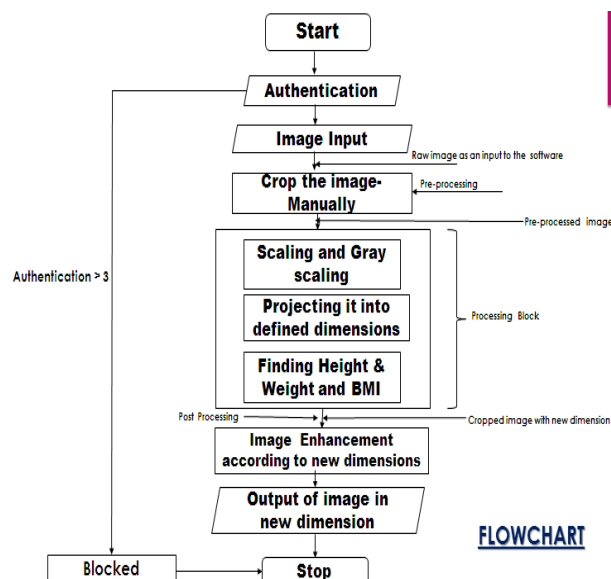| 5	Upper Arm	3.3%	2.7%
6	Forearm	1.9%	1.6%
7	Foot	1.5%	1.2 %
8	Hand	0.6%	0.5%

IV. WORK FLOW

Image will be captured from a Video and will be sent into the Pre-Processing block. The raw image is been sent to the Pre-Processing block and manual cropping is performed. The pre-processed image is sent to the software for further processing. The object is Scaled and then Gray Scaled. The cropped object is projected into defined dimensions. If the complete body is seen then it uses **size ()** function to calculate the height Using the phi theory the height and weight and Body Mass Index of an object is calculated only if some of the body parts are seen.
Post Processing
Now, the cropped image with new dimensions is been sent to post- processing block.
Image enhancement is done according to new dimensions.
Output of image - in new dimensions.

V. DATAFLOW

1. DFD Level 0:

Here, it is shown that an image is given as an input to the Recreation software by a user. The first input given is the User details in terms of user_id and password. After the successful Authentication the input raw image is been processed and the output is given as Body Mass Index (BMI), height and weight of the human and the Enhanced image.
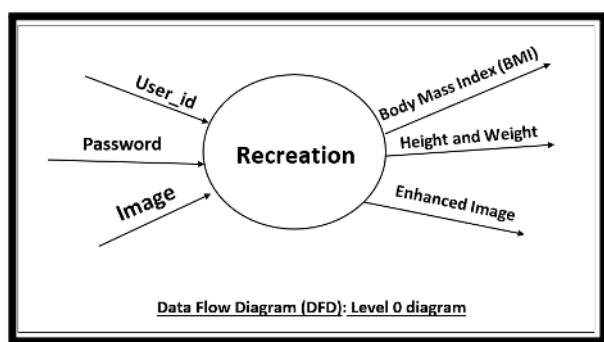
FIG 2: DATA FLOW DIAGRAM

2. **DFD Level 1:**

In this, the processes or steps which are carried out by the software are shown. First is the pre-processing block where the raw image as an input to the software is sent by the user. There the scaling and grey scaling of image is done. That pre-processed image is sent to the processing block where the object is separated/cropped from the converted image. The cropped object Outline is been created. Using the phi theory, the height and weight (Body Mass Index) of an object is calculated. Then that processed image is sent to the post-processing block where Image Enhancement is done according to new dimensions. And lastly Output of image in new dimensions is been generated and displayed as the results of the inputted raw image.
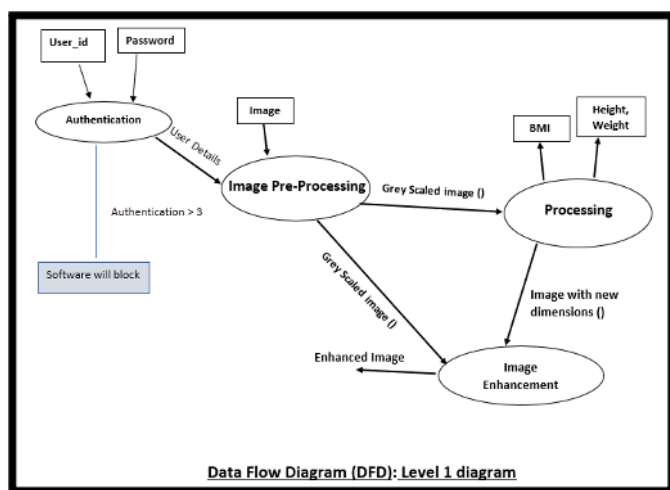

FIG 3: DATA FLOW DIAGRAM 1

3. **DFD Level 2**

The Sub- blocks are:
1. **Authentication**

It includes user id and password as input and user details as output.

FIG 4: AUTHENTICATION DFD

2. **Pre- processing**
   It takes user details and raw image as an input and performs scaling and grey scaling of an image and results out to be a grey scaled image.
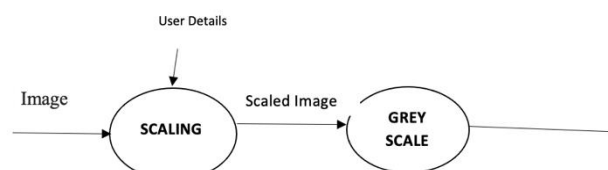

FIG 5: PREPROCESSING DFD

3. **Processing Block**
   The grey scale image is sent as an input to the Processing block crop field then that cropped image human outline is created and sent for that calculations. The height, weight and Body Mass Index (BMI) is calculated and image is created with new dimensions.
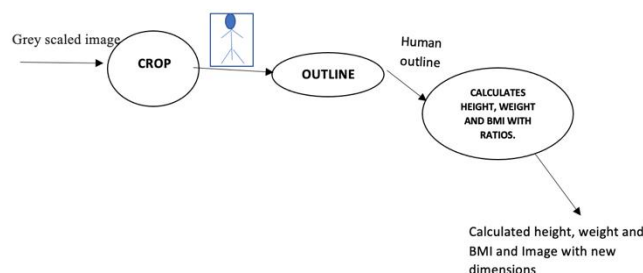

FIG 6: PROCESSING DFD

4. **Image Enhancement Block**
   Here, the grey scale of image with new dimensions is given as an input. The image noise reduction and Sharpening is done for a clear view of raw image.
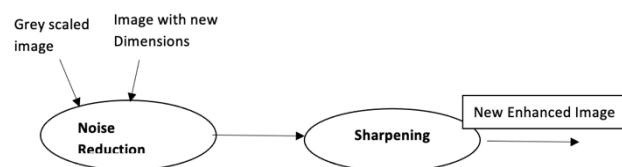

FIG: IMAGE ENHANCEMENT DFD

VI. ACKNOWLEDGMENT

We Have Presented a new algorithm for determining height measurements directly from a video image which gives estimate height of the culprit. It makes an organization to compare 2 images. It is time efficient The algorithm draws on results from projective geometry and computer vision and requires minimal geometric information the viewed scene. This new approach to metrology enables valuable information, about an individual to be obtain from video footage this is generally too poor for facial recognition.

The goal of facial identification is to determine if the individual being questioned is the same as the known to the exclusion of others. This is called an Individualization or Identification in the forensics field. In the biometrics field such a one-to-one comparison is called a Verification; however, in forensic science the term verification generally specifically refers to a peer review or other post-examination evaluation process. Because there are differences in terminology between the forensic and biometric communities, when using a word that has different meaning we will introduce both terms and then continue with the forensic usage for consistency. In contrast to an identification, the examination may lead to the conclusion of Elimination of the known individual as being the questioned individual. If an individualization or elimination can't be made, it is concluded that no definitive conclusion is possible, while listing noted similarities and/or dissimilarities

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