MACHINE LEARNING TECHNIQUES FOR PREDICTION AND CURE FOR EARLY STAGE OBESITY

Dr.P.Babu Professor,

R.Nadhiya[*2], **G.Nivetha** Under Graduate Students[2]

Department of ECE, K.S. Rangasamy College of Technology, Tiruchengode-637 215,

Tamil Nadu, India **:** nivethapriya257@gmail.com

ABSTRACT

Human self-perceptions encode a lot of valuable biometric data, for example, student tone, sexual orientation, weight, and so forth among this data, body weight is a decent marker of ailments. This work examines the breaking down body weight from 2-dimensional (2D) front facing view human self-perceptions. The generally utilized weight file (BMI) is utilized as a proportion of body weight. To research the issues at various degrees of troubles, three possible issues, from simple to hard, are considered. All the more explicitly, a system is created for investigating body weight from human self-perceptions. Calculation of five anthropometric components is proposed for body weight portrayal. A visual-body-to-BMI dataset is gathered and cleaned to work with the review, which contains 5900 pictures of 2950 subjects alongside the marks relating sexual orientation, stature, and weight. Some fascinating outcomes are showing the attainability of breaking down body weight from 2D self-perceptions. Likewise, the proposed strategy beats two condition of-workmanship facial pictures based weight examination approaches as a rule.

Keywords: BMI, Obesity, Machine learning, predictive analytics

1.INTRODUCTION

1.1 IMAGE PROCESSING

Image processing is a system to perform some operation on an image, in order to get an enhanced image or to prize some useful information from it. It's a type of signal processing's in which input is image and affair may be image or characteristics/ features associated with that image. Currently, image processing is among fleetly growing technologies. It forms core exploration area within engineering and computer wisdom disciplines too.

Image processing principally includes the following three way

• Importing the image via image accession tools;

• Analysing and manipulating the image;

• Affair in which result can be altered image or report that's grounded on image analysis.

There are two types of styles used for image processing namely analogue and digital image processing. Analogue image processing can be used to the hard clones like printouts and photos. Image judges use colorful fundamentals of interpretation while using these visual ways. Digital image processing ways help in manipulation of the digital images by using computers. The three

general phases that all types of data have to suffer while using digital fashion arepre-processing, improvement, and display, information birth.

1.1.1 VISUAL ANALYSIS OF BODY MASS INDEX (BMI)

Body mass indicator (BMI) is a value deduced from the mass (weight) and height of a person. The BMI is defined as the body mass divided into the forecourt of the body height and is expressed in units of kg/ m2, performing from mass in kilograms and height in measures.

1.1.2 BMI IDENTIFICATION

The extensively used body fat index body mass indicator (BMI = weight (lb)/ height (in) 2) is used as a measure for body weight. The BMI is a accessible rule of thumb used to astronomically classify a person as light, normal weight, fat, or fat grounded on towel mass (muscle, fat, and bone) and height. Major adult BMI groups are light (under18.5 kg/ m2), normal weight (18.5 to24.9), fat (25 to29.9), and fat (30 or further). The BMI has been employed as a measure in numerous former studies which is also a threat factor for numerous conditions.

LITERATURE SURVEY

2.1. Christian Pfitzner et.al.,[1]It has proposed at 2018, This paper describes the estimation of the body weight of a person in front of an RGB-D camera. A check of different styles for body weight estimation grounded on depth detectors is given. First, an estimation of people standing in front of a camera is present. Second, an approach grounded on a sluice of depth images is used to gain the body weight of a person walking towards a detector. The algorithm first excerpts features from a point pall and forwards them to an artificial neural network (ANN) to gain an estimation of body weight. Besides the algorithm for the estimation, this paper further presents an open- access dataset grounded on measures from a trauma room in a sanitarium as well as data from callers of a public event. In total, the dataset contains 439 measures. The composition illustrates the effectiveness of the approach with trials with persons lying down in a sanitarium, standing persons, and walking persons. Applicable scripts for the presented algorithm are body weight- related dosing of exigency cases.

2.2Antitza Dantcheva This paper Body height, weight, as well as the associated and compound body mass indicator (BMI) are mortal attributes of relevance due to their use in a number of operations including surveillance,re-identification, image reclamation systems, as well as healthcare. Former work on automated estimation of height, weight and BMI has generally concentrated on 2D and 3D full- body images and vids. Little attention has been given to the use of face for estimating similar traits. Motivated by the below, we then explore the possibility of estimating height, weight and BMI from single- shot facial images by proposing a retrogression system grounded on the 50-layers ResNet- armature. In addition, we present a new dataset conforming of 1026 subjects and show

results, which suggest that facial images contain discriminative information pertaining to height, weight and BMI, similar to that of body- images and vids. Eventually, we perform a gender-grounded analysis of the vaticination of height, weight and BMI.

2.3M.A.PascaliD.Giorgi This paper presented a new approach for estimating height, weight and BMI from single- shot facial images, grounded on ResNet-50. Trials conducted on a new dataset, which we've made intimately available, redounded in promising correlation rigor of over to $\rho = 0.78$ for womanish weight estimation and mean absolute crimes of2.3 for womanish BMIestimation. We didn't observe a significant gender- bias in estimating height, weight and BMI. Still, further work is necessary in this regard. Unborn work will involve the fresh study of age and race in order to ameliorate application of facial appearance for height, weight and BMI estimation. The height, weight and BMI estimator was motivated by the current need for tone-individual tools for remote healthcare, as well as for soft biometrics categorization in security operations.

3.EXISTING SYSTEM

Facial markers of body arrangement are regularly contemplated in developmental brain research and are significant in computational and scientific face acknowledgment. We surveyed the relationship of weight file (BMI) and midsection to-hip proportion (WHR) with facial shape and surface (shading design) in an example of youthful Middle European ladies by a blend of mathematical morph metric and picture examination. Appearances of ladies with high BMI had a more extensive and rounder facial framework comparative with the size of the eyes and lips, and moderately lower eyebrows.

4.PROPOSED SYSTEM

The proposed ways has been applied on BMI images attained from ML as mentioned by. It's a web-grounded image library lines that offers comprehensive and growing collection of image related to BMI. They give high quality image captured using web cam in different resolution. Prints from social networks contain lots of hard biometric and soft biometric information, similar as pupil color, gender, height, weight, age, etc. Similar biometric information can be employed for individual identification. Among the soft biometric measures, body weight and fat are good pointers of health conditions. The purpose of this work is to explore the feasibility of body weight analysis from the visual appearance of mortal body images and we develop some useful characterize for body weight/ fat from mortal body images. The extensively used body fat index body mass indicator (BMI = weight (lb)/ height (in) 2 is used as a measure for body weight. The BMI has been employed as a measure in numerous former studies which is also a threat factor for numerous conditions. Generally, BMI is measured in person with special bias (1). For accessible monitoring, this work explores an

automatic BMI vaticination using machine literacy approach through python, from people's diurnal life prints. After relating the BMI rate, if it exceeds than normal state, it give diet map for that person through Raspberry pi and display the information in system. Our work can be of great benefit to medical experimenters to pierce BMI data from social networks, which may give lots of sources for health monitoring in large populations.

4.2 BLOCK DIAGRAM

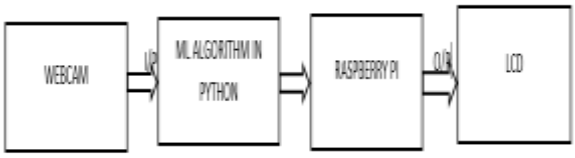

Figure4.2 BLOCK DIAGRAM

It deals with the data pre-processing, application of ML algorithms for the classification of imbalanced data, techniques used for the treatment of data imbalance and the evaluation of suitable algorithms for improved prediction accuracy in Python. It can be challenge to directly estimate BMI values from 2D human body images.

4.2.1 PREPROCESSING

We consider three cases, from easy to hard. By probing these problems at different situations, we can approach the algorithms address the affiliated problems in real operations. The main methodology of this work are as follows

A new visual- body-to-BMI dataset is collected and containing some sample images of subjects (each contains a brace of images), which is the first dataset of its kind.

A computational frame is developed for body weight and BMI analysis from 2D mortal body images, which can reuse either a single image or a brace of images.

Five anthropometric feature are proposed for body weight analysis from 2D body images.

4.2.2 IMAGE SEGMENTATION

The goal of the image segmentation is to extract important information from an input image. It is a process of image recognition system, which can reduce the complexity of image and analysing the 2D image become similar.

4.2.3 FEATURE EXTRACTION

Feature extraction of image processing is a technique of redefining a large set of redundant data into a set of features of reduced dimension. Transforming the input data into the set of features is called feature extraction as shown in figure 4.2.3 . Then the following texture and shape based features are extracted from these whole images:

- Edge enhancement, to enhance the border of the shape
- Enhance area, width, height and circumference of the body

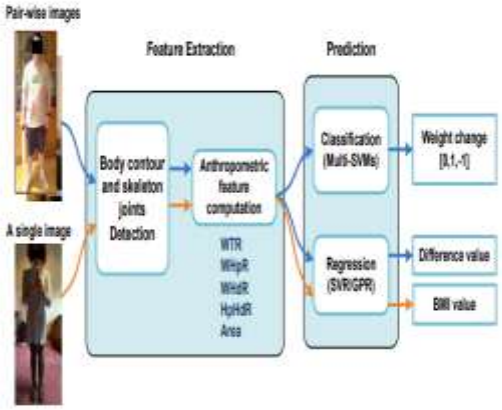

Figure 4.2.3 Feature Extraction

5.RESULT AND DISCUSSION

The proposed techniques has been applied on BMI images obtained from ML as mentioned in. It is a web based image library files that offers comprehensive and growing collection of image related to BMI. They provide high quality image captured using web cam in different resolution. It is then given to pre processing which converts image into BMI value.

Figure 5.1 Calculation of BMI

The above figure 5.1 describes a how BMI is calculated from input images. The widely used body fat indicator body mass index (BMI= weight(lb)/ height(in) 2 × 703) is used as a measure for body weight. BMI prediction using machine learning approach through python, from people's daily life photos.

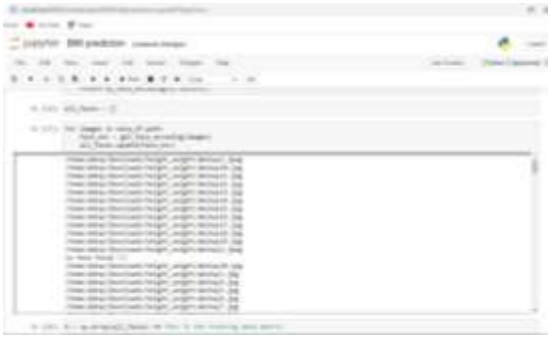

Figure 5.2 Input images

The above figure 5.2 shows the input images which is given for BMI calculation. A new visual-body-to-BMI dataset is collected and containing some sample images of subjects (each contains a pair of images), which is the first dataset of its kind. It is developed for body weight and BMI analysis from 2D human body images, which can process either a single image or a pair of images.

Figure 5.4 Analysing of BMI

OUTPUT

NORMAL RANGE OF BMI

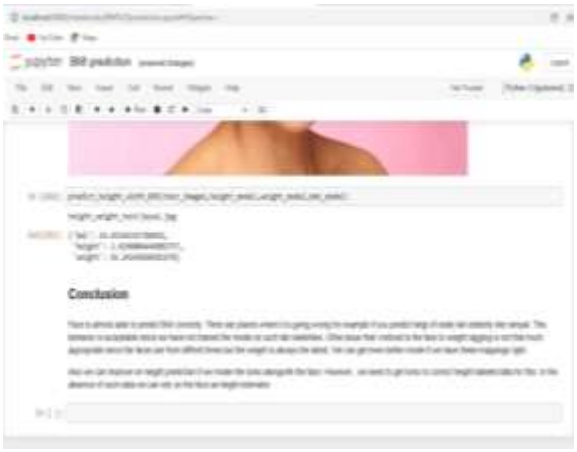

Figure 5.4 Normal range of BMI

OBESITY

DIET CHART FOR OBESITY

Figure 5.4 Diet chart for obesity

It is challenging to directly estimate BMI values from 2D human body images.. If it is normal (18.5 < BMI ≤ 25) the process will stop by showing of values, but if it exceed more than normal state (i.e., obese (BMI > 30)) we have given a healthy meal plan for weight loss diet chart

CONCLUSION

This proposed technique has estimate height, weight and BMI from single-shot facial images, based on regression models. Experiments conducted on the dataset, resulted in absolute mean error of 0.083 and variance score of 0.43.Algorithm isto calculate the Body Mass Index and compare the

results with classifiers. The system extracts a set of feature based on shape properties. The features selection algorithm in order to reduce the training time and obtain the best features to obtain a good classification accuracy. The future result will be show that this feature will present a good demarcation in identification of BMI using images.

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