

LITERATURE REVIEW

Body mass index, or BMI, is an abbreviation for a numerical value that indicates a person's level of health. In [1], it is shown that a person's BMI is related to their financial and mental well-being. The majority of our everyday tasks have been replaced by technology in this automated environment, which may be the cause of our poor healthspan. In [2] which is the first study to demonstrate that a facial image is sufficient to determine a person's BMI, it described a statistical approach using statistical methods like the Gaussian process and the least squares estimation was used to learn more about how BMI is connected with face attributes. In [3] the research paper demonstrated that the HOG (histogram of oriented gradient) algorithm, which did not involve data preprocessing, was employed to identify faces in an input image. Later, HOG was used along with CLAHE which took a lot of time but accuracy has increased. In [4], it is proved that CNN has a 94% accuracy rate when used to classify images, which is why it is a popular technique today.

Google created the Facenet architecture to recognise and identify faces in images. In [5], it is justified that facenet provides more accuracy than CASIA-WebFace and VGGFace2, when they are compared. Machine learning models like regression and the random forest algorithm are used to predict BMI from an input image. In [6], researchers used the measurements of neck circumference and waist-to-height ratio as part of a study employing binary regression analysis to find the influence of gender, physical activity index, and physical measurements on the chance that the user falls into the overweight category. Random forest demonstrated the highest accuracy in a study comparing the results of logistic regression, support vector machines, and random forests[7].

1.<https://bmcpsy psychiatry.biomedcentral.com/articles/10.1186/s12888-022-04077-w>

2.<https://pages.cs.wisc.edu/~gdguo/myPapers/BMIface2013.pdf>

- A first computational approach to predict BMI from face images automatically
- a large database with more than 14,500 face images(MORPH II)
- which demonstrates the feasibility of developing a computational system for BMI prediction from face images.
- The base paper for this publication was psychologists and scientists found that facial features have relations to human weight or BMI but there is no prediction of BMI from face images.
- Seven facial features are obtained and statistical methods are used to predict BMI like the support vector regression Gaussian process and the least squares estimation.
- Result: BMI from image

3.https://www.researchgate.net/publication/348917290_Face_Detection_and_Recognition_Using_Machine_Learning

- Used this paper to learn more about face detection and recognition algorithms
- HOG(histogram of oriented gradient) for face detection
- CLAHE for data preprocessing
- SVM for classification
- The HOG-SVM algorithm takes less time but CLAHE-HOG-SVM is more accurate and time-consuming.

4.https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3833453

5.https://www.researchgate.net/publication/339173834_Face_Recognition_using_FaceNet_Survey_Performance_Test_and_Comparison

- Information about facenet and its accuracy is studied in this research paper

6.https://www.researchgate.net/publication/335272676_Application_of_Binary_Logistic_Regression_Model_to_Assess_the_Likelihood_of_Overweight

- Studied about how logistic regression can be used to identify the health of a person

7. Pdf, should generate a link