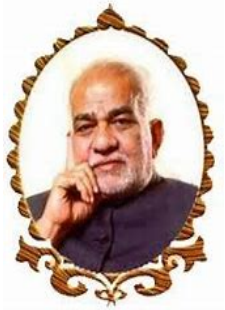
BVRIT HYDERABAD College of Engineering for Women
Department of Information Technology



BODY FAT ESTIMATOR USING ENSEMBLE METHODS

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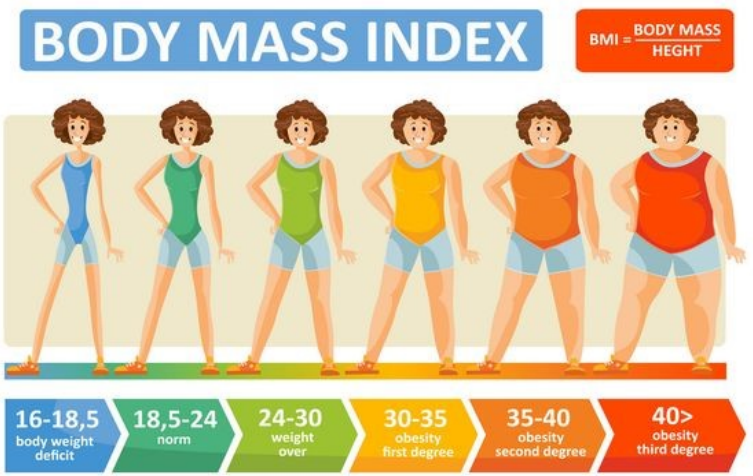
Abstract

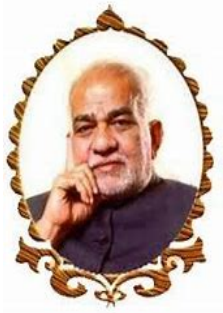
- Obesity or excessive body fat causes multiple health problems and diseases.
- Obesity treatment and control need an accurate determination of body fat percentage (BFP).
- The accurate prediction of body fat percentage is based on body measurements, important for assessing obesity and diseases.
- The model not only captures physical attributes but also considers emotional factors, resulting in improved accuracy and individualization of body fat predictions.

Introduction

- Obesity, characterised by excess body fat, is a medical problem that increases one's risk of other diseases and health issues, such as cardiovascular diseases, diabetes, musculoskeletal disorders, depression and certain cancers.

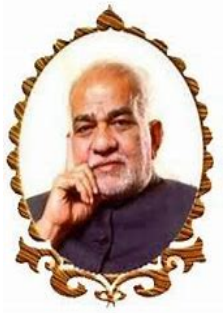


Literature Survey



S. No	Title of the paper	Author(s)	Description
1	Body Fat Prediction using Various Regression Techniques	Nikhil Mahesh, Peeta Basa Pati, K. Deepa, Suresh Yanan - 2023	In this paper, they compare the performance of several machine learning models based on Regression, to predict the body fat percentage.
2	Classification of Obesity Using Several Machine Learning Techniques	Jyothi Parsola - 2022	The 3D Scanner techniques like Computed Tomography is used for determining the body fat percentage.

Literature Survey



S. No	Title of the paper	Author(s)	Description
3	Hybrid Machine Learning Model for Body Fat Percentage Prediction Based on Support Vector Regression and Emotional Aritificial Neural Network	Solaf A. Hussain, Nadire Cavus, Boran Sekeroglu - 2021	In this paper, they have used the data selection technique the "left-out" approach and integrated the physical and emotional characteristics for body fat prediction.
4	Prediction of Women Obesity using Naive Baye's Algorithm	Dr. Naveen N, Rakshitha Kiran P - 2019	The Naive Baye's Algorithm is used and Women dataset is collected, based on the risk factors the algorithm worked to predict the body fat percentage.

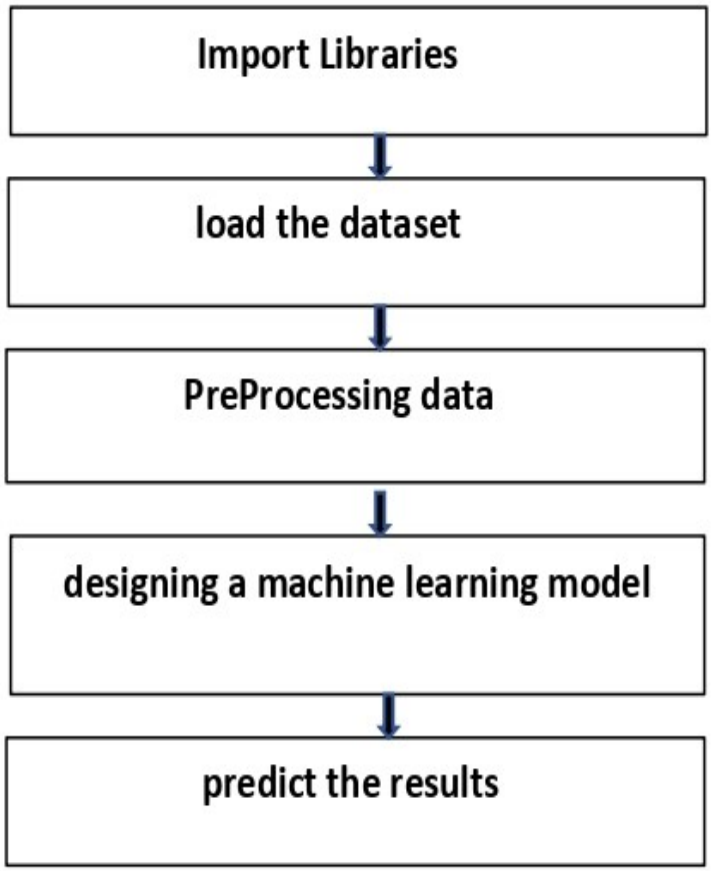
Existing method

- Machine learning models are inherently adaptable to various data sizes, but the efficiency of these models can be significantly improved through careful data selection.
- One effective data selection technique is the "left-out" approach, which is utilized by machine learning and artificial intelligence.
- The left-out approach is a valuable tool for understanding the role of individual variables in predictive modeling.
- Traditional methods for BFP estimation often involve complex and costly procedures, limiting their effectiveness.

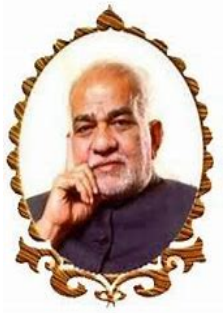
Proposed Method

- The aim is to provide an accurate model for an innovative and cost-effective approach to predict BFP accurately.
- To develop a novel machine learning model that integrates Support Vector Regression (SVR), Random Forest and various boosting algorithms like AdaBoost (Adaptive Boosting), Gradient Boosting Machines (GBM), XGBoost (Extreme Gradient Boosting) for accurate prediction of body fat percentage.

Flow Chart


Import Libraries
load the dataset
PreProcessing data
designing a machine learning model
predict the results

Modules



- **Support Vector Regression :** Support Vector Regression (SVR) is a machine learning algorithm used for regression tasks, to predict a continuous target variable.
- **Random Forest :** Random forest is a meta estimator that fits a number of decision tree classifiers on various sub-samples of the dataset and uses averaging to improve the predictive accuracy.
- **AdaBoost (Adaptive Boosting) :** The final prediction is made by a weighted sum of the individual weak learner predictions.
- **XGBoost (Extreme Gradient Boosting):** It incorporates regularization techniques, parallel processing, and a custom loss function to improve model performance.

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- Dr. Naveen N, Rakshitha Kiran P "Prediction of Women Obesity using Naive Baye's Algorithm", Volume 6, Issue 2, 2019, PP 12-17, DOI: http://dx.doi.org/10.20431/2349-4859.0602002 https://www.arcjournals.org/pdfs/ijrscse/v6-i2/2.

THANK YOU!!