BMI Calculator : Literature Review

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Shakib Mahmud Dipto

Lecturer, Dept of CSE

University of Liberal Arts Bangladesh

Submitted By:

MD. Jahidul Haque Junayer [221014071]

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Reviews

Review 1

The literature review of the "Automatic BMI Calculator" study presents an in-depth exploration of BMI measurement methods, focusing on the shift from traditional manual procedures to modern automated systems. It describes the historical progression of BMI calculation, stressing the limitations of previous systems depending on weight-for-height charts and manual measurements. The review underlines the significance of BMI as a measure of relative weight and its link with health concerns such as cardiovascular diseases and certain malignancies. Furthermore, the paper examines the issues involved with manual BMI calculation, including the time-consuming nature of the process and the necessity for reliable and rapid assessment methods. It highlights the emergence of automated BMI calculation technologies, including as software programs and sensor-based systems, as a solution to these issues. The potential benefits of automation in hospitals, schools, and fitness centers are investigated, underlining the significance of effective BMI testing in various settings. In addition, the review looks into the components and functionalities of the proposed BMI calculator, including ultrasonic proximity sensors, load cells, and ZigBee modules. It addresses how different technologies contribute to the precision and reliability of BMI measurements, as well as their suitability for data transfer and analysis. Overall, the literature study gives a full overview of BMI measuring methodologies, the justification for automation, and the essential components of the proposed BMI calculator system.

Review 2

The study titled "Comparative Analysis of Manual and Automatic Body Mass Index System Calculator" outlines the creation of an Arduino-based automated BMI machine for accurate and economical measurement of body mass index (BMI). It underscores the importance of BMI as a measure of body fat accumulation and its relevance in determining health risks linked with obesity. The study compares the accuracy of the automated BMI machine with manual measurements using statistical analysis. The introduction gives background information on BMI, its calculation formula, and its usefulness in predicting weight status and health concerns. It underlines the need for precise BMI assessment techniques, particularly in clinical and educational settings. The methods section covers the development of the automated BMI machine employing load cells and ultrasonic sensors interfaced with a PIC microcontroller. It discusses the measurement technique for weight and height, as well as the calculation of BMI based on the obtained data. Results and discussion describe the statistical analysis of data gathered from 120 individuals using both manual and automated BMI approaches. Bar charts and tables compare average values of weight, height, and BMI between the two approaches for different age groups and genders. The study demonstrates a link between manual and automated measures, verifying the accuracy of the automated BMI technique. Conclusions highlight the effective creation and validation of the automated BMI equipment, validating its accuracy compared to manual measures. The article argues that the automated BMI method might be

utilized effectively in clinical and educational contexts to test BMI and monitor health status. Recommendations offer further enhancements to the automated BMI system, including integrating with additional modules for data transfer and including email alerts for remote monitoring. Overall, the research contributes to the improvement of BMI measurement technology and highlights the need of correct BMI evaluation in healthcare and education.

Review 3

The literature analysis of the study "Development of an Automatic Body Mass Index Measurement Machine" gives a detailed overview of the significance of Body Mass Index (BMI) in assessing health risks associated with obesity and related disorders. It examines the history of BMI calculation and evaluates its reliability as a tool for evaluating patients' health state. The paper analyzes various methods for measuring BMI, stressing the advantages of BMI over other procedures in terms of simplicity and informativeness. Additionally, it examines recent studies on BMI measurement techniques, including the use of load cells and ultrasonic sensors. The review also investigates the limits of existing BMI testing methods and proposes the construction of a low-cost automated BMI measurement equipment. Overall, the literature analysis highlights the importance of BMI in assessing human health status and sets the stage for the construction of the automated BMI assessment equipment described in the paper.

Review 4

The research study in "Design Body Mass Index (BMI) and Body Fat Percentage Using Fuzzy Logic" examines the significance of BMI in health evaluation, stressing its association with obesity and associated health hazards. It analyzes existing standards for balanced nutrition and weight prediction systems, highlighting the need of precise BMI calculation. The paper addresses the application of fuzzy logic approaches, particularly the Mamdani method, in BMI and body fat percentage prediction. Various research are referred to highlight the efficacy of fuzzy logic in handling uncertainty in BMI evaluation. Furthermore, the paper covers the development of BMI assessment equipment and systems, exhibiting technical developments targeted at boosting accuracy and accessibility. Overall, it presents a complete overview of methodology, tools, and applications relevant to BMI estimation and body fat percentage measurement.

Review 5

The research “Motion-To-BMI: Using Motion Sensors to Predict the Body Mass Index of Smartphone Users” offers a novel approach for estimating Body Mass Index (BMI) using smartphone motion sensors. It presents a hybrid deep neural network model integrating Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM) networks, together with a Multiscale Entropy (MEn)-based filtering technique to boost prediction accuracy. Through extensive trials on two public datasets, MobiAct and Motion-Sense, the proposed model

outperforms classic feature-based approaches such as kNN, SVM, and decision trees. Results reveal that jogging activity is the best suitable for BMI prediction, followed by walking and walking upstairs. Furthermore, the MEn-based filtering technique increases prediction accuracy by minimizing noise and irrelevant information in the data. The study concludes that the suggested approach shows potential for continuous BMI monitoring using smartphone sensors and offers future research directions in unsupervised Human Activity Recognition (HAR) and transfer learning for data annotation.

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