An User-friendly Body Posture Recognizing and Guiding System for Accurate Health Care Test Results

A PROJECT REPORT

Submitted by,

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Under the guidance of,

Ms. Sterlin Minish T N

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

At

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

BENGALURU

MAY-2025

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that the Project report **"An User-friendly body posture recognizing and guiding system for accurate health care test results"** being submitted by **"Sanketh S"** , **"Mohan C V"**, **"Manu K"**, **"Shaun Franklyn"**, **"V Vishwa Kiran Reddy"** bearing roll number's **"20211CCS0124"** , **"20211CCS0133"** , **"20211CCS0140"** , **"20211CCS0158"** , **"20211CCS0190"** in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering (Cyber Security) is a bonafide work carried out under my supervision.

14/05/2025

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DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **An User-friendly body posture recognizing and guiding system for accurate health care test results** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering (Cyber Security)**, is a record of our own investigations carried under the guidance of **Mrs. Sterlin Minish T N, Assistant Professor, Presidency School of Computer Science and Engineering , Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

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ABSTRACT

Self-service wellness kiosks, which enable users to independently check their health, have been developed in response to the growing need for autonomous healthcare solutions. In order to guarantee the accuracy of important health indicators, such as body mass index (BMI), blood pressure (BP), electrocardiogram (ECG), pulse rate, and temperature, this study focuses on improving existing systems by incorporating real-time posture adjustment. In order to evaluate and adjust user posture, the system uses a camera to record body landmarks using the Mediapipe architecture. It then provides real-time feedback in the form of visual guidance. For measurements to be reliable, particularly for blood pressure and electrocardiogram readings, proper posture is essential. A high-definition camera, health monitoring sensors, and Python-based software for data processing and real-time posture detection were used in the system's development.

Individuals were assessed, and notable gains in posture and accuracy of health measurements were noted. The neck inclination errors dropped from 27.4° to 19.8°, while the torso misalignment went from 9.5° to 1.8°. Consequently, the blood pressure readings improved by 12.2%, and the ECG's accuracy rose by 7.7%. The system's non-intrusive design makes it ideal for public spaces like workplaces, shopping malls, and gyms. Posture analysis plays a crucial role in improving health and ergonomics. This project implements a real-time posture analysis system using Flask, OpenCV, and MediaPipe to track and provide guidance on correct posture.

The system has been upgraded with a fully responsive frontend built using React.js and Bootstrap, ensuring an intuitive and user-friendly experience. A seamless Flask-based API enables interaction between the frontend and backend, while MongoDB efficiently stores user data. The upgraded interface enhances usability and accessibility, making the system suitable for health monitoring and medical applications.Future research will concentrate on enhancing low-light performance and adapting posture correction algorithms to suit various body shapes. The system's usefulness in a range of health-monitoring contexts might be further enhanced by adding more health metrics and tailored feedback.