

ABSTRACT

Blood pressure is a measure of the force exerted by blood against the walls of arteries as the heart pumps it. Monitoring blood pressure is crucial because it serves as a key indicator of various cardiovascular health conditions. This research focuses on developing a non-invasive method to monitor blood pressure using Photoplethysmography (PPG) technology, providing a practical alternative to traditional measurement techniques. The primary goal is to develop an algorithm capable of estimating heart disease risk using Random Forest. The approach utilizes PPG data extracted from videos recorded by placing a finger on a smartphone camera with the flash activated. Data is collected from a diverse range of participants across various age groups and health conditions to ensure the method's reliability in different scenarios. The data extraction process is meticulously carried out to identify the most informative features of the PPG signals. Random Forest is employed due to its effectiveness in analyzing complex data and addressing challenges often encountered in biomedical signal processing, such as data complexity and signal variability.

Keywords: Photoplethysmography (PPG), Blood Pressure, Random Forest, Feature Extraction, Machine Learning, Non-Invasive Health Monitoring