

8. SUMMARY

The attempt to predict blood pressure based on a dataset of photoplethysmography signals is motivated by the belief that PPG data alone can effectively forecast blood pressure, as indicated by research papers [4].

This potential has sparked interest in developing new PPG sensors and enhancing existing ones, as well as integrating machine learning models into cuffless wearable devices.

To predict blood pressure accurately, an annotated dataset is carefully selected, explored, and analysed. Various filtering techniques are evaluated, and the most suitable ones are chosen based on specific requirements. The literature review guides the selection of PPG signal features for extracting and utilising in predicting systolic blood pressure. These features are integrated into the dataset, complementing the existing physical characteristics of individuals. The initial model demonstrates a coefficient of determination of **0.9196**, indicating a strong performance though not perfect. To enhance the model further, diverse data engineering techniques are employed, followed by a comparative analysis.

The application of wavelet mathematical transformations shows significant promise and has generated considerable interest, prompting further investigation and potential integration into future model enhancements. The continuous improvement of the model encompasses both hardware aspects, such as sensor enhancements, and machine learning techniques including principal component analysis, various encoding methods, and scaling techniques. This multifaceted approach underscores the ongoing quest for refining predictive models in the realm of blood pressure estimation.