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Paper Title:	Modeling Blood Pressure through Non-invasive Vascular Contraction Signals
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Abstract

Chronic non-communicable diseases such as diabetes and hypertension are leading causes of mortality, often resulting in complications like heart disease and stroke. Blood pressure, a critical indicator of hypertension, is typically measured intermittently, which limits continuous monitoring. This study explores the development of a prototype for continuous blood pressure monitoring using photoplethysmogram (PPG) signals. By analyzing vascular contraction signals, we modeled blood pressure through three key PPG features: heart rate, average normal-to-normal intervals, and mean envelope size. Data from 35 participants were collected at rest and post-exercise. Using a two-variable linear regression equation, we found that the combination of heart rate and mean envelope size provided the most accurate systolic blood pressure estimates, with a mean error of 8.58% ± 5.81. This research highlights the potential for non-invasive, continuous blood pressure monitoring to better manage hypertension and related conditions.