Method to Measure Ambulatory Blood Pressure

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Technology description

Short Description

An approach for measuring ambulatory blood pressure using a two-dimensional force sensor array and photoplethymogram.

Abstract

Hypertension affects over 29% of adults in the United States and accounts for an estimated 12.8% of all deaths worldwide. The chronic condition is a significant risk factor for cardiovascular disease and increases risk of heart attack, stroke, kidney problems, and death. The leading device to measure blood pressure is the traditional cuff which has limited sensitivity and specificity. Blood pressure readings are often inaccurate due to the device's intermittent use and confinement to office settings. Healthcare professionals increasingly seek continuous 24-hour monitoring, called ambulatory (AMBP) monitoring, to detect and manage hypertension. AMBP monitoring has increased accuracy and demonstrated potential to improve patient outcomes, but current options are bulky and expensive. Northwestern researchers solve this problem with a flexible wristband design. The device integrates data from a pressure-sensor array and a pulse oximeter to achieve the best readings possible. Continuously worn, the device measures ambulatory blood pressure noninvasively and may be integrated into smart watches for user convenience.

Application area

At-home monitoring of ambulatory blood pressure

Mobile fitness biosensors

Advantages

Noninvasive

Reliably and continually measures ambulatory blood pressure (AMBP)

Maintains arterial contact required for tonometric blood pressure reading

Wearable device (e.g. smart watch) integration

Institution

Northwestern University

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