

Smartphone Based Blood Pressure Measurement using Cameras and Pressure Sensors

This technology presents multiple methods for self-measurement of blood pressure using sensors already built into smartphones.

What is the Problem?

Hypertension, or persistently elevated blood pressure, is a major cause of death worldwide. It is a major risk factor for strokes, heart failure, dementia, and other conditions. Measurement of blood pressure is a standard measurement for visits to the doctor and is an important source of information for diagnosing hypertension and related conditions. However, despite sphygmomanometers being a gold-standard methodology and in common usage in doctors' offices, in-office blood pressure measurement does not correlate well with actual blood pressure while fully relaxed at home due to factors such as the white-coat observer effect. The importance of these measurements for diagnosing potentially serious conditions means that constant innovation is necessary to make blood pressure measurement both more accurate to everyday life, and therefore more accessible for an everyday person to take their own measurements in relaxed conditions to hand to their doctor.

What is the Solution?

The ubiquity of smartphones combined with their multi-modal sensing capabilities has the potential to become a powerful tool for enabling everyday people to track their own blood pressure in relaxed settings. Smartphones are equipped with all the tools necessary to mimic the function of a sphygmomanometer to measure the PPG signal, or light absorption fluctuation as blood pulses with heartbeats. Using a smartphone's built-in backward-facing and forward-facing cameras along with the pressure sensor in the front of the phone, this innovation puts forward multiple methods for the measurement of blood pressure.

What is the Competitive Advantage?

Given the importance of blood pressure measurement for diagnosis of hypertension, making blood pressure measurement easier and more accessible is of crucial importance. This technology uses sensors that are built into smartphones, meaning that no extra hardware would be needed and does not need to be performed at a doctors' office. Using only camera and pressure signals, the technology puts forward multiple methods taken at different points on the body.

Technology ID

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