

# Extracting Physiological Signals from Smartphone Sensors

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## Abstract

Two of the primary vital signs are breathing- and pulse rate. To monitor them however there are various solutions. All require additional equipment and expertise to use. Smartphones are nowadays at every person's arm length, therefore, could be cost-effective for crowd- and personal health screening. Diaphragmatic breathing can be measured with Inertial measurement units. To optimize the breathing detection the smartphone has to be placed in the middle of the epigastric region. The tissue in the region vibrates because of the presence of the abdominal aorta which is also picked up by the IMU. Breathing, which is usually under 2 Hz can be filtered out with a low-pass filter. The pulse can be seen between 10 Hz 22 Hz. After filtering, breathing is detectable by a peak detector algorithm and can be differentiated from noises.

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