

### S3-1.3

## Intelligent System for Monitoring Vital Signs at Patient's Home

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The primary concern in present healthcare systems is increasingly shifting towards chronic diseases. This presents itself with the difficulty to monitor and follow-up a demanding number of patients. Technology development allows to significantly improving the quality of life. The aim of this project is to monitor a number of vital functions while making it accessible for the patients and the care takers. The vital functions of interest were: heart's electrical activity, heart rate, oxygen saturation levels in peripheral blood, arterial blood pressure, temperature and galvanic skin response. In addition, there is the possibility of geo-tracking. The system uses a Healthy Pi board for data acquisition using the Linux operating system. The ECG module is based on an operational amplifier with multiple filtering levels so as to acquire a series of signals corresponding to a physiological graph in one lead which are sent to an Atmega microcontroller. They are forwarded towards the Raspberry Pi platform which compiles and shows it on the attached display. Signal calibration was done using a simulator for ECG testing for physiological and pathological heart conditions (ventricular fibrillation, heart stroke). The pulse-oximetry module determines the oxygen saturation levels in blood, but also helps monitor/compare the peripheral values (upper limbs) of pulse against heart rate according to the ECG. The advantages of this system consist of: efficient, quick data acquisition and storage, remote real time monitoring, friendly user interface, possibility of geo-tracking, accessibility for the patients and care takers.