Design and Implementation of Healthcare Systems based on Wearable Wireless Sensor Networks

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Patient Health Monitoring Systems importance is gained from the growing demands for medical care systems to observe several medical parameters. The wearable healthcare monitoring systems may consist of various types of biosensors measuring significant physiological parameters like:

- blood pressure,
- electrocardiogram (ECG),
- muscle electromyography (EMG),
- oxygen in the blood (SPO2),
- body temperature,
- patient position, etc.

The aggregated data from the biosensors are transferred into the portable monitoring unit (PMU) of the system and this can be handled either by wires or by wireless links.

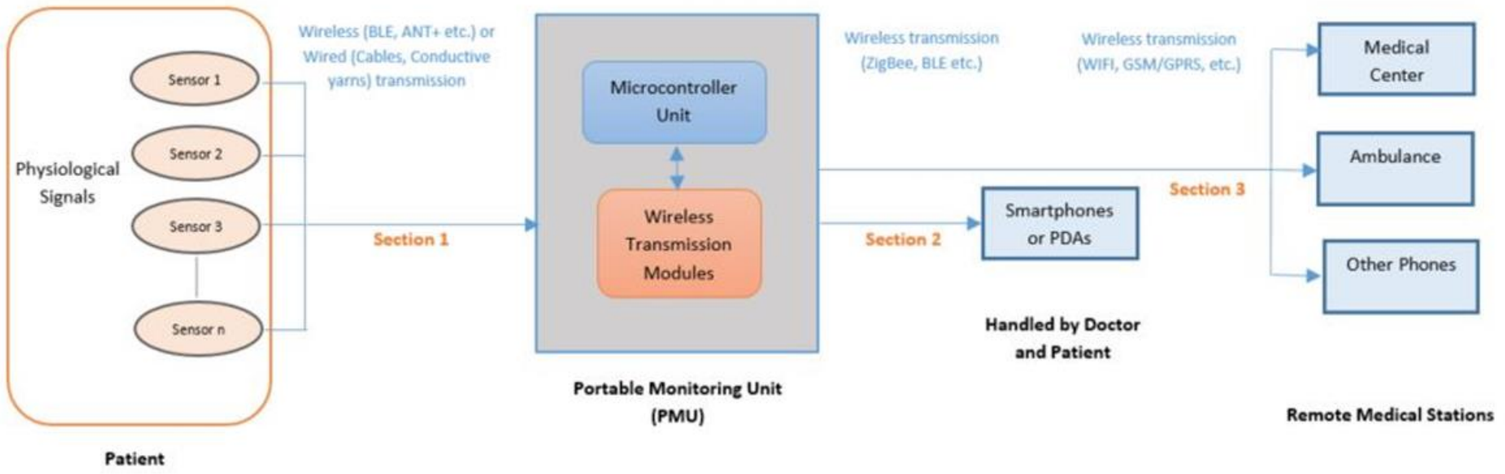

Figure 1. Data transmission

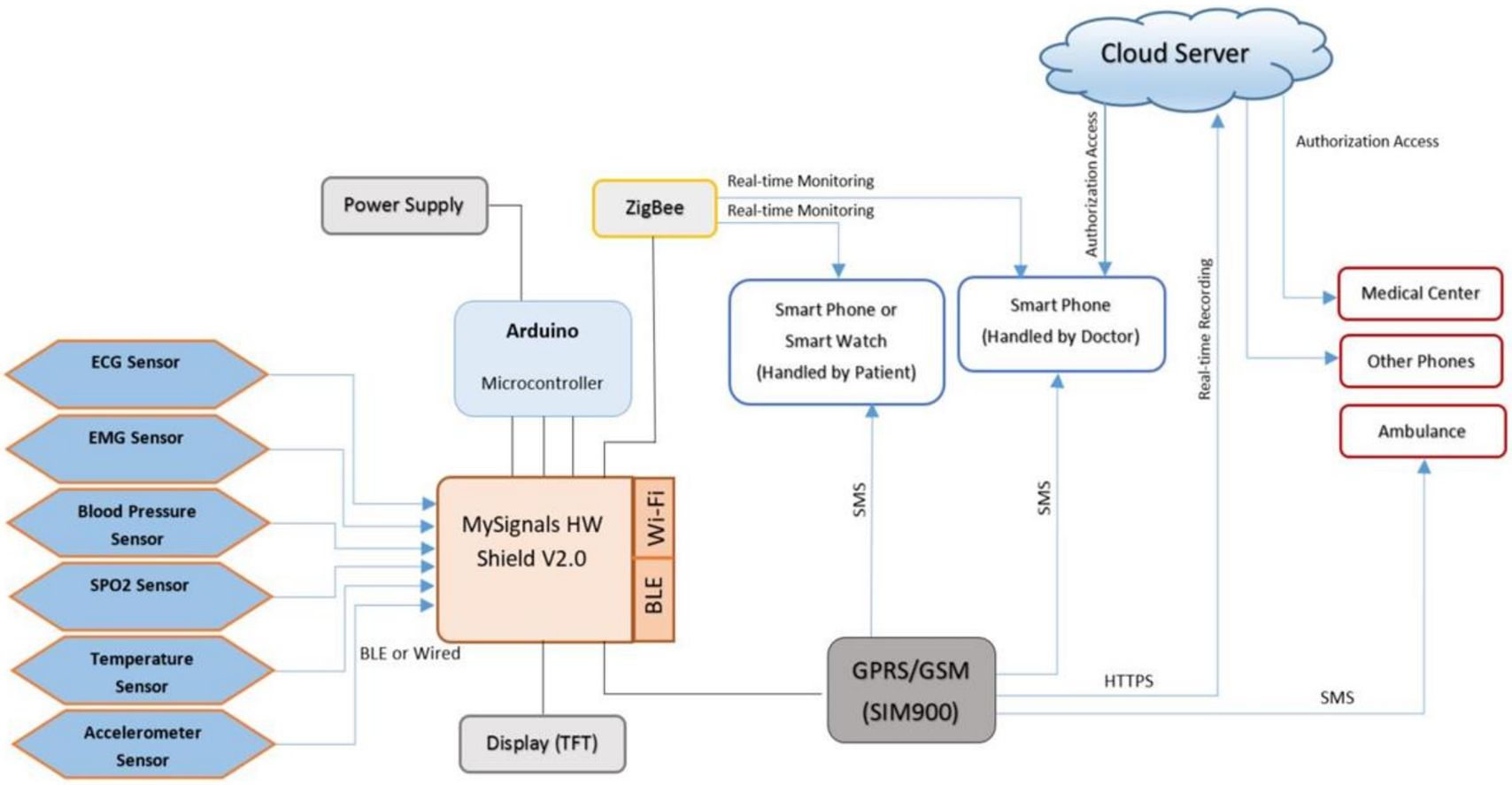

Figure 2. System architecture

Basic requirements that must be met in wireless medical sensors:

- Wearability
- Reliable communication
- Security
- Interoperability

Medical applications implemented based on:

- FPGAs
- Microcontroller platforms: Intel Galileo, ARM7 LCP 2148, Arduino Uno Rev.3

Removal Noise from ECG signal Based on Filtering Techniques:

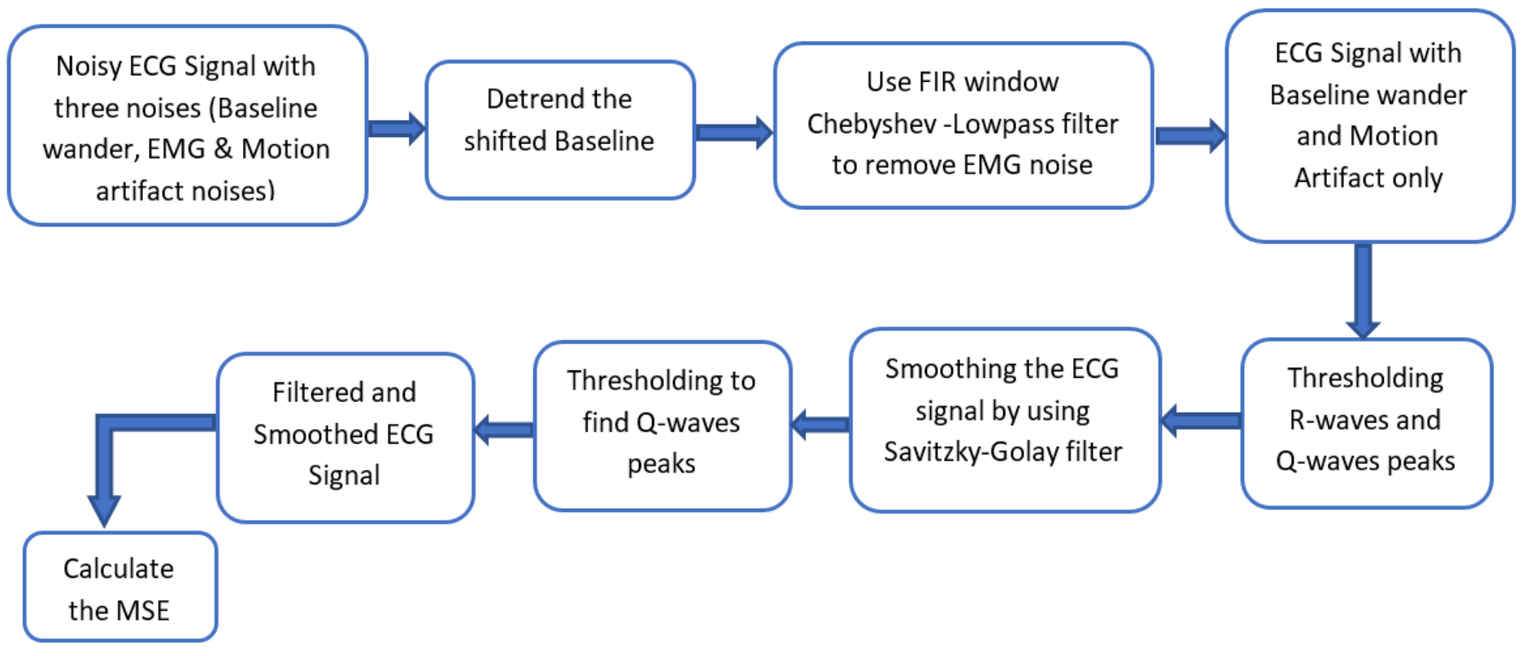

Figure 3. The block diagram of a filtering model and ECG processing