

A Wireless Communication System for Remote Medical Monitoring

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Remote medical monitoring is of increasing importance as it enables low cost in-situ monitoring of patients regardless of their location. Realization of this technology requires that medical sensors (forming a body sensor network, BSN) are capable of detecting physiological data and transferring this data to physicians via wireless links. In this paper, we will present a wireless communication platform to provide a reliable and secure pathway for transferring health informatics data from on-body medical sensors to a mobile device or remote database server.

The developed prototype system is shown in the figure below. Its operation is as follows: The medical sensors collect the vital signals from the body (i.e. temperature, motion, etc), digitize them using an on-board processor and transfer them to a wireless transceiver. The wireless data link between the PDA or Wi-Fi unit and the sensor transponder is realized using a Bluetooth bridge. However, for convenience, a Zigbee protocol was used to collect the medical data from the sensors and transfer them to a transponder. This developed wireless system was evaluated on an Android phone App specifically developed to present the received data into a user-friendly format. This data can be subsequently encrypted and securely transferred to a server-side PHP-based cloud database via 3G/4G or Wi-Fi networks. They can then be securely accessed by physicians who can recommend appropriate action.

The proposed medical communication system, mobile App, data de/encryption are applicable to a variety of sensors. As an example, a wireless connectivity will be demonstrated for a wearable lung sensor. To do so, a RF power detecting circuit was designed to convert RF signals from the sensor to D.C. signal data for processing. Details and demonstration of this medical wireless communication system will be presented at the conference.

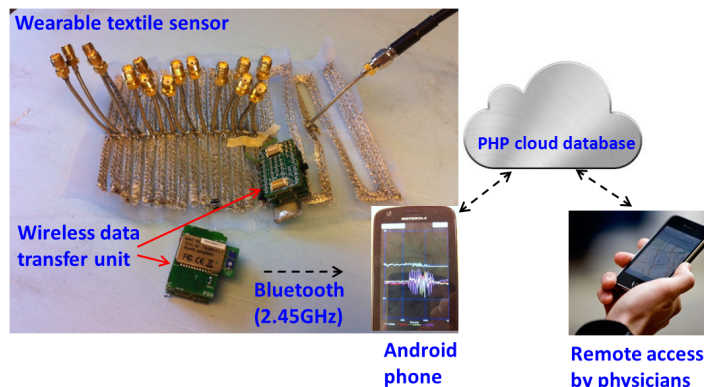


Fig. 1. Wireless medical monitoring prototype for multiprobe textile lung sensor.