

# Monitoring of Physiological Signs using Telemonitoring System

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**Abstract.** The paper presents telemonitoring system for distant monitoring of physiological signs. The system is designed as modular system content input modules for monitoring various vital signs like ECG, NIBP and oxygen saturation, control module and telecommunication modules for streaming data using various wireless technologies like Bluetooth, GSM and WiFi. The input and telecommunication modules are interchangeable. The system is able to preprocess acquired signals using filtration, parameterization etc. It allows stream both raw data and only aggregated data. The monitoring part is supplemented by PC based part for storing data in database, prospective processing of data and sharing data with other systems.

**Keywords:** telemonitoring, vital signs monitoring, smart home, assistive technology

## 1 Introduction

The paper presents telemonitoring system for distant monitoring of physiological signs. The telemonitoring is one of the up-to-date techniques in the field of assisted technologies and smart homes for distant monitoring of vital signs. This technique is able to monitor patients in their own environment continuously without significant limitations and to provide information about the health of persons under monitoring. [?, ?, ?, ?]

## 2 Design and Realization

The presented system is designed as a system for distant monitoring of physiological signs like electrocardiogram (ECG), peripheral blood oxygen saturation (SpO<sub>2</sub>) and non-invasive blood pressure (NIBP). The system is modular and consists of three independent parts – input modules, control unit and telecommunication modules. The main task of the system is to sense some vital sign, to process acquired signals and to communicate them to PC based system using any type of standardized wireless technologies such as Bluetooth, WiFi or

GSM. The input modules transduce measured biosignal to appropriate electrical value (digital data or voltage frequently). The control unit serves several tasks simultaneously. The important ones are to acquire input signals and to convert them to digital data (of course for analog inputs only), to process these signals and/or to parameterize them, to prepare data packets according to defined communication protocol and to send the data. The control unit has to provide the user interface of whole system also. The communication modules support the transmission of signals between control unit and PC based system by any type of wireless techniques like Bluetooth, GSM, WiFi etc. The interfaces between modules are strictly defined and the modules are reciprocally interchangeable. It means it is possible to choose measured signal and the type of connection and to assemble user required system in easy and quick way.

The monitoring part is supplemented by PC based application for storing data in database, prospective processing of data and sharing data with other systems.

### 3 Conclusion

The modular system for telemonitoring of physiological signs has been described shortly in this paper. The system is user modifiable for wide range of use. It could be a fundament for complex equipment of smart home and could be a base of more sophisticated system in the field of assistive technologies.

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