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A sensor network to iPhone interface separating continuous and sporadic processes in mobile telemedicine

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Abstract:

In this contribution, a new concept for interfacing sensor network nodes (motes) and smartphones is presented for the first time. In the last years, a variety of telemedicine applications on smartphones for data reception, display and transmission have been developed. However, it is not always practical or possible to have a smartphone application running continuously to accomplish these tasks. The presented system allows receiving and storing data continuously using a mote and visualizing or sending it on the go using the smartphone as user interface only when desired. Thus, the processes of data reception and storage run on a safe system consuming less energy and the smartphone's potential along with its battery are not demanded continuously. Both, system concept and realization with an Apple iPhone are presented.

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I. Introduction

INDUSTRIALIZED countries are facing a demographic change which will push the social security systems to their limits. In Germany, the ratio between people older than 65 and between 15 and 64 is expected to surpass 50% until 2030 [1]. The number of older people living alone and cannot be taken care of and assisted by their families will also increase. This will lead to a significant increase in health care need and in a loss of quality of life for people dependent of care. For these reasons a great effort is done worldwide to develop systems able to keep people in good health through prevention, early diagnosis and short hospital stays. Assuring that elderly people with cognitive or physical impairments keep self-sufficient is also often issued. Many of these systems use sensor networks to collect health information about the individual in their home or outside and to process it in order to detect deviations and give help based on the collected information to the individual or to the clinicians. As smartphones and small handheld electronic devices are spreading, it makes sense to use them as assistant devices, increasing their mass, volume and price [2]. In this contribution, we present a new concept for interfacing assistant devices and smartphones aiming at increasing the combined system's energy efficiency and security.

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