Microwave FMCW Doppler radar implementation for in-house pervasive health care system

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Abstract

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Abstract:
In recent years, the research in the area of ubiquitous healthcare has intensified. There are many technological advances regarding the development of unobtrusive sensors for cardiac and respiratory activity, but the current scenario is still far away from an everyday life fulfilled with ubiquitous healthcare systems. In this paper, it is described the usage of 24GHz microwave FMCW (frequency modulated continuous wave) Doppler radar (MDR) as one of the main components of a pervasive biomedical system that is part of an assistive environment for the people with less mobility or people with long term health condition. As parts of the present work, in this paper are mentioned the design and implementation of an assistive environment based on a MDR sensor, an experimental study concerning the microwave Doppler radar characteristics and remote sensing of heart rate and breath rate, based on acquisition and processing of the signals delivered by the used radar.

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Contents

I. Introduction

In many countries, demographic developments, social changes, and the rising costs of health and social care, considering the people with chronic diseases, elderly population or people with less mobility, imposed the introduction of electronic health records (EHR) as a solution to improve health care efficiency and safety. Furthermore, efficient pervasive health care architectures, mechanisms and systems can alleviate the problem of supporting and caring for people with a long term condition and less mobility. Ubiquitous or pervasive healthcare has the main goal of building sensing and computing systems that permit long-term health assessment of the human subjects and health critical events signaling for high level of unobtrusiveness. Ubiquitous healthcare systems defined like “in-house” implementations permit the long-term health status assessment of subjects affected by chronic diseases, elderly people, and people with less mobility, among others. On the other hand, comparing with the ambulatory healthcare, the ubiquitous healthcare as part of telemedicine systems can permit, in the future, to stabilize the actual tendency of healthcare rising costs caused by demographic changes [1].

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