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## I. Introduction

By monitoring cardiac functions important information can be obtained on the body's physiological adaptation and the intensity of effort as well as on health and wellness, medical condition and emergency situations. New development of sensors and electronic techniques made quantifying the movements generated by the beating heart very easy in domestic furniture such as chair [1]-[4], bed [5] or weighting scale [6], [7], overcoming disadvantages of heavy and inconvenient methods used in hospitals, in the first half of the 20th century. Moreover, in recent years, small and cheap accelerometers based on MEMS technology, became part of a new class of wearable systems for long term monitoring of seismocardiography - sometimes referred to as sternal acceleration ballistocardiogram [8] - in a wider range of conditions, including sleep [9] and daily life activities [10]. Furthermore, in order to minimize disruption of the subjects' activities, particularly where prolonged monitoring is needed, various approaches based on radar technology were described in the literature for cardiac function monitoring. Additional benefits of radar technology for vital signs Sign in to Continue Reading monitoring include the versatile ability to function at a distance of monitored person, through clothing, and for some type of radar technology also the capacity to acquired vital signals through the walls [11]-[14]. Meanwhile, testing reliability of the implemented unobtrusive system for physiological parameters and motor activity measurement, represent an important challenge considering the variety of hardware and software for unobtrusive monitoring, the particular interaction between the monitored person and the measurement system, but also the personalized response provided by the systems for different users. In the paper is presented a comparative study of two unobtrusive systems for heart rate acquisition. We studied and compared cardiac signal acquired with EMFIT, Frequency Modulated Continuous Wave Doppler Radar (FMCW Doppler radar) and Finapres based system. With this comparative study we aimed to underscore the information associated with the acquired signs provided by the two unobtrusive heart rate monitor as well as the performance on heart rate estimation of the implemented systems by our research team.

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