

Body sensor area networks: Definition, state-of-the-art, performances, limitations and perspectives

Abstract

The medical domain is becoming a very attractive area for emergent wireless communication systems. Growing needs for new biomedical monitoring systems are creating new challenges for Wireless Body Area Network design and performances. This talk presents a brief summary of Wireless Body Area Networks systems, their potential applications, their challenges as well as new developed solutions for ultra-low power e-health systems with a comparison of their performances and their limitations. A state of art of UWB solutions for WBAN systems is also presented and discussed.

Keywords

WBAN, UWB, medical applications, e-Health, distance monitoring

The 60 GHz band: A new promising solution for distance monitoring systems

Abstract

The market demand of high definition applications knows in the recent years a very exponential growth. Many domains are more and more concerned by the progress of wireless communications systems in order to satisfy users' needs in terms of high-speed communications systems.

An important number of the developed wireless communication systems for medical applications are operating in the unlicensed ISM band, using in the majority of cases the 433 MHz, 900 MHz, 2.45 GHz and 5.8 GHz bands. However, these bands are characterized by a high concentration of activities with a few regulation protections and a lot of interferences and noise from the existing systems.

To solve this problem, one of the solutions consists in moving to new allocated frequency bands. The 60 GHz band appears as a promising frequency band offering a lot of advantages for low ranges indoor communications especially after the allocation of at least 7 GHz of band all around the world.

The talk concerns the potentiality of the 60 GHz band (mmWave band) for distance human monitoring where the power consumption of the system represents a real issue. In this context a solution based on Multi band On Off Keying (MBOOK) impulse transceiver is presented. The low complexity of the system, the performances of this architecture and the small antenna size make it a good candidate for wearable nomadic sensor networks for medical monitoring.

Keywords

mmWaves, 60 GHz, UWB, medical applications, OOK solution, low power systems

Rahma ABDAOUI, Phd

LISITE, MINARC, 21 rue d'Assas, Paris, France

Dr. Rahma Abdaoui received the MSc degree from ESIEE Paris (Ecole supérieure d'ingénieurs en électronique et électrotechnique de Paris) and a PhD in Electronics, optoelectronics and systems from the University of Paris Est Marne la Vallée in 2009 and 2012 respectively. Her PhD work was carried out at ESYCOM Laboratory and concerned 60 GHz nomadic transceiver architectures for high-rate low-range communication systems.

Dr. Abdaoui joined MINARC research team at ISEP in January 2013 where she is currently an assistant professor in wireless communications systems. She is also head of the MSc programme in electronics and telecommunications at the ISEP. Her research interests include front-end design for low power biomedical applications.