ABSTRACT SUBMISSION

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Development of Customized Wearable Systems for Human Health and Well-being Online Monitoring

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ABSTRACT (NO MORE THAN 500 WORDS:)

Considered as a wearable system, an intelligent and connected garment represents an opportunity for meeting the specific needs of various populations. Compared with other connected objects, an intelligent garment is capable of carrying out an online monitoring of the wearer's health and well-being thanks to the use of sensors close to his body and embedded in the textile. Based on measured data, it can provide intelligent services to the target population (the elderly, the disabled, soldiers, security agents, athletes, etc.) in order to manage and optimize their day-to-day activities, such as physical exercise control, geolocation, monitoring and forecasting of chronic diseases, as well as helping to cope with food nutrition control, stress and depression, disease risk management, injuries and shortcomings.

In this presentation, we will propose a series of principles for designing intelligent and connected garments, including textile and garment design, electronic devices integration, local decision support and cloud expert system development. These principles will permit to enhance product autonomy and intelligence level and fully integrate devices into textiles. The proposed garment design process can be more adapted to customized body shapes of the target population and is capable of selecting the most relevant fabrics and garment patterns for minimizing signal attenuation and improving wearer's comfort. Also, the integrated physiological sensors are connected to a centralized microcontroller, on which a local decision algorithm is implemented for filtering noises, extracting relevant features from measured signals and intelligently interacting with the cloud platform. A cloud healthcare expert system will be built by learning from data measured on the garments of all individuals in order to provide online professional medical advices to wearers. Both consumers and medical professionals will benefit from this design process.