



Topic of the Speech:

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

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Professor Xianyi Zeng is a full professor (exceptional class) in ENSAIT Textile Engineer School, France, Director of the GEMTEX National Laboratory, and also a guest professor of Donghua University, Soochow University, Nankai University and Wuhan Textile University. In ENSAIT, he is head of the Department of Design, Distribution and Management and the Research Group for Human-Centered Design.

His main research interests include artificial intelligence, digital fashion, sensory analysis, intelligent wearable systems, computerized garment design and customized production management. He has published more than 110 papers in peer-reviewed international journals and presented more than 170 papers at international conferences, and supervised more than 30 PhD students. In addition, as project coordinator, he has conducted three European projects (Asia-Link, SMDTex – European Joint Doctorate Program on Textile Sustainable Design and Management (Erasmus Mundus Program), FBD_BModel – Fashion big data and business model (H2020 Program)) and a number of national and regional research projects such as PRTH (French National Research Program for Textile and Clothing), IOTFetMov (ANR Program), Camille 3D (FUI Program), SUCRE (ARCIR Program) and industrial projects in cooperation with international groups in France and Europe.

ABSTRACT SUBMISSION



-For invited speaker only

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.