

# Smart Textile Integrated Wearable Systems

Xiaoming Tao

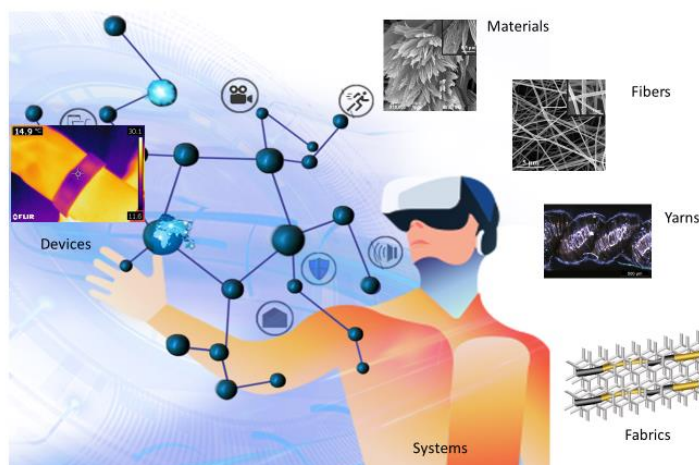
Research Center for Smart Wearable Technology, Hong Kong Polytechnic University, Hong Kong, China

Corresponding and Presenting Author. E-mail: xiao-ming.tao@polyu.edu.hk

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## Graphical Abstract

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## Abstract

With the advance of materials and microelectronic integration technology, modern electronics are moving toward an emerging field of wearable systems. Smart textile electronic device deals with the fibers or fiber assemblies with electronic functions to generate, transmit, modulate and detect electrons. Interactive textile electronic devices may provide suitable platforms for many applications due to its excellent performances and unique immersive features such as light-weight, handiness, flexibility, comfortability, low strain even in large deformation. This paper presents a glance view of our recent work on interactive smart textile devices and their integrated wearable systems: their materials, fabrication technologies, system integration, modelling and evaluation methods. The integrated wearable systems incorporate sensing network for interfacial forces; composite yarn actuators; electronic yarns; fabric energy generators of piezo- and triboelectricity and thermoelectricity; fibrous flexible electronic circuit board assemblies. Their applications in healthcare are also illustrated by two examples, that is, Easypacer™ system for Parkinson's patients and intelligent medical compression system for chronic venous disease.

**Keywords:** Smart textile; wearable technology; flexible electronics.

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## Biography of Presenting Author



**Xiaoming Tao** is Chair professor and Director, Research Center for Smart Wearable Technology, Institute of Textiles and Clothing, Hong Kong Polytechnic University. She obtained a BEng in textile engineering from East China Institute of Textile Science and Technology with a 1st class prize and a PhD in textile physics from University of New South Wales in Australia. Prof. Tao is former World President from 2007 to 2010, an elected Fellow of the Textile Institute and elected Fellow of American Society of Mechanical Engineering. Prof. Tao is Editor-in-Chief for Handbook of Smart Textiles by Springer, Prof. Tao is internationally known for her leading research work on intelligent fibrous materials, nanotechnology, photonic fibres and fabrics, flexible electronic and photonic devices, smart wearable technology, yarn manufacturing and textile composites. Prof. Tao has conducted numerous research projects and published over 400 journal papers and 7 research monographs. Her published work has been cited by over 19600 times. 12 inventions from her team have been applied in industry around the world. She is the recipient of the Honorary Fellowship of Textile Institute in 2011, Founder's Award by Fiber Society of USA in 2013, Guanghua Engineering Science and Technology Award by Chinese Academy of Engineering.

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