



Topic of the Speech:

In-situ Complex Evaluation System of Tactile Handle Behavior of Fabric

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Dr. Zhaoqun Du is a full Professor and Ph.D. supervisor in College of Textiles, Donghua University, China. Zhaoqun Du obtained his B.S. Degree in Textile Materials and Engineering from Zhongyuan University of Technology in 2001. He obtained his PhD in Textile Materials and Design from College of Textiles, Donghua University in 2006. Then, he was an associate professor in College of Textiles, Donghua University from 2008 and to be a supervisor for both MSc and PhD from 2014; after that, he was a professor from 2014, when he pursued in Development, Characterization and Modelling of Structure and Behaviour of Textile Materials, and Design, Formation and Characterization of Functional and Smart Textiles.

He has taught various courses at undergraduate and postgraduate levels including Textile Materials, Physics of Textiles, Quality Analysis of Textile Products, Textile Measurement, Testing Principle of Fibre and Its Products, Textile Measurement, Nanocomposite Science and Technology. He has over 100 scientific publications, including more than 80 SCI/EI papers. He has been authorized over 70 patents, including New Method to Structure and Properties of Textile Materials, New Structure and Materials for Functional and Smart Textile Products, and Innovative Testers for Behaviour of Textile Products. Some of the achievements are awarded by Fujian provincial government and China National Textile Industry Association, National Excellent Doctoral Dissertation Nomination Award Shanghai Excellent Doctoral Dissertation Award, Shanghai Municipal Education Commission and Shanghai Education Development Foundation.

He has been undertaken and completed over 20 projects from National Natural Science Foundation of China, Fok Ying Tung Education Foundation, and Ministry of Education of China, State Commission of Science and Technology for National Defense Industry, the Fundamental Research Funds for the Central Universities, the National Key Research and Development Program of China. By acquiring substantial research funding and obtaining funding support from government funding bodies and industry, he established Comprehensive Handle Evaluation System For Fabrics and Yarns, Theoretical Analysis of Mechanical and Heat/Mass Transferring Behaviour of Fiber Assembly, Finite Element Analysis and Simulation of Mechanical Deformation of Textile Products, Characterization and Modeling of Structure and Behaviour of Textile Materials, and Design and Characterization of Functional and Smart Textiles, Deformation Mechanism of Textile Materials with Negative Poisson's Ratio.

-For invited speaker only

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ABSTRACT (NO MORE THAN 500 WORDS:)

Tactile handle of fabric is being widely concerned by consumers, especially for the development of natural-like synthetic fibres, such as wool-like, silk-like fibres. For tactile sense of fabric, fabric handle generally refers to the senses of touch, which determines the quality of fabrics and the key evaluation index in the field of textiles production and sales. Fabric handle is a reflection of the physiological sensation produced by touching the fabric by hand and subjective evaluation processed through the human brain.

So, it necessitates to effective measurement methods to fabric tactile handle. Then, the presentation presented a general definition of fabric handle, and introduced current testing methods to fabric handle. Firstly, it clarified popular subjective assessment method to classify fabrics by handle through panels tactile posture to distinguish the tactile sense of fabrics. Secondly, it is now widely accepted that the fabric handle is determined by its mechanical properties so that we can quantitatively characterize fabric handle, the correlating instrument was necessary to be developed. So, several popular objective evaluation methods to test fabric handle were analyzed. Pierce who first started to derive bending length and stiffness formula of fabric to evaluate the stiffness of samples by Cantilever method. Kawabata Evaluation System for Fabric (KES-F) developed by the Hand Evaluation and Standardization Committee (HESC) according to Kawabata's basic design concept and Fabric Assurance by Simple Testing (FAST) designed by the Commonwealth Scientific and Industrial Research Organization (CSIRO) are used for measuring mechanical properties of fabric under low-stress condition. Finally, several new in-situ measurement methods in principle to fabric handle are analyzed, which include the PhabrOmeter fabric evaluation (PFE) system, fabric touch tester (FTT) and the comprehensive handle evaluation system for fabrics and yarns (CHES-FY). These three systems are developed to acquire comprehensive properties derived from the extraction curve of fabrics under a complex low-stress deformation process and could effectively evaluate the handle of fabrics.

The presentation is useful for textile scientists and engineers to understand the developing trend of handle characterization method to fabrics, and it is helpful to develop effective apparatus to better measure fabric handle and to provide a precise guideline to design new handle fabrics so as to have a comprehensive recognition on fabric handle.