

tive 3D body model suitable for people with limited body abilities. *Journal of textile science & engineering*, ISSN. 2014:2165-8064.

3. Chow D, Leung K, Holmes A. Changes in spinal curvature and proprioception of schoolboys carrying different weights of backpack. *Ergonomics* 2007;50(12):2148-56.
4. Stjepanovic Z, Stjepanovic TK, Cupar A, Rudolf A, Jevsnik S. Construction of adapted garments for people with scoliosis using virtual prototyping and CASP method/Constructia articolelor de îmbracaminte adaptate persoanelor cu scolioza utilizând prototiparea virtuala si metoda CASP. *Industria Textila*. 2016; 67(2): 141.
5. Rudolf A, Cupar A, Kozar T, Stjepanović Z. Study regarding the virtual prototyping of garments for paraplegics. *Fibers and Polymers* 2015; 16(5): 1177-92.
6. Bruniaux P, Cichocka A, Frydrych I. 3D Digital Methods of Clothing Creation for Disabled People. *Fibres Text East Eur*. 2016, 24, 5(119): 125-31.
7. Hong Y, Curteza A, Zeng X, Bruniaux P, Chen Y, editors. Sensory evaluation based fuzzy AHP approach for material selection in customized garment design and development process. *Book of Abstracts* 2016; Iasi: IOP Publishing.
8. Yan Hong, Pascal Bruniaux, Xianyi Zeng, Kaixuan Liu, Yan Chen, Min Dong. Virtual Reality Based Collaborative Design Method for Designing Customized Garment of Disabled People with Scoliosis. *International Journal of Clothing Science and Technology* 2017; 29(2): 11.
9. Luo ZG, Yuen MMF. Reactive 2D/3D garment pattern design modification. *Computer-Aided Design* 2005; 37(6): 623-30.
10. Wang L, Zeng X, Koehl L, Chen Y. A Human Perception-Based Fashion Design Support System for Mass Customization. *Knowledge Engineering and Management*: Springer; 2014. p. 543-55.
11. Chen X, Tao X, Zeng X, Koehl L, Boulenguez-Phippen J. Control and optimization of human perception on virtual garment products by learning from experimental data. *Knowledge-Based Systems* 2015; 87: 92-101.
12. Hong Y, Bruniaux P, Zeng X, Curteza A, Liu K. Design and evaluation of personalized garment block design method for atypical morphology using the knowledge-supported virtual simulation method. *Textile Research Journal*.0(0):0040517517708537.
13. Wu Y, Mok P, Kwok Y, Fan J, Xin J. An investigation on the validity of 3D clothing simulation for garment fit evaluation. *Proceedings of the IMProVe* June. 2011:463-8.
14. Zeng X, Ruan D, Koehl L. Intelligent sensory evaluation: Concepts, implementations, and applications. *Mathematics and Computers in Simulation* 2008;77(5-6): 443-52.

□ Received 03.10.2016 Reviewed 19.05.2017

The Scientific Department of Unconventional Technologies and Textiles specialises in interdisciplinary research on innovative techniques, functional textiles and textile composites including nanotechnologies and surface modification.

Research are performed on modern apparatus, *inter alia*:

- Scanning electron microscope VEGA 3 LMU, Tescan with EDS INCA X-ray microanalyser, Oxford
- Raman InVia Reflex spectrometer, Renishaw
- Vertex 70 FTIR spectrometer with Hyperion 2000 microscope, Brüker
- Differential scanning calorimeter DSC 204 F1 Phenix, Netzsch
- Thermogravimetric analyser TG 209 F1 Libra, Netzsch with FT-IR gas cuvette
- Sigma 701 tensiometer, KSV
- Automatic drop shape analyser DSA 100, Krüss
- PGX goniometer, Fibro Systems
- Particle size analyser Zetasizer Nano ZS, Malvern
- Labcoater LTE-S, Werner Mathis
- Corona discharge activator, Metalchem
- Ultrasonic homogenizer UP 200 st, Hielscher

The equipment was purchased under key project - POIG.01.03.01-00-004/08 Functional nano- and micro textile materials - NANOMITEX, co-financed by the European Union under the European Regional Development Fund and the National Centre for Research and Development, and Project WND-RPLD 03.01.00-001/09 co-financed by the European Union under the European Regional Development Fund and the Ministry of Culture and National Heritage.



Textile Research Institute
Scientific Department of Unconventional Technologies and Textiles
Tel. (+48 42) 25 34 405
e-mail: cieslakhm@iw.lodz.pl