



**Proceedings of the
2nd International Conference on
3D Body Scanning Technologies**

Lugano, Switzerland, 25-26 October 2011

Editor and Organizer

Hometrica Consulting - Dr. Nicola D'Apuzzo
Switzerland
www.hometrica.ch



This compilation © 2011 by Hometrica Consulting - Dr. Nicola D'Apuzzo, Switzerland. Reproduction of this volume or any parts thereof (excluding short quotations for the use in the preparation of reviews and technical and scientific papers) may be made only after obtaining the specific approval of the publisher. The papers appearing in this volume reflect the author's opinions. Their inclusion in this publication does not necessary constitute endorsement by the editor or by the publisher. Authors retain all rights to individual papers.

ISBN 978-3-033-03134-0

Published by

Hometrica Consulting - Dr. Nicola D'Apuzzo
Via Collegio 28, CH-6612 Ascona, Switzerland
Tel: +41 91 7915524
Email: info@hometrica.ch
Web: www.hometrica.ch

Table of contents

Introduction	8	
Technical Session 1: Medical Scanning Systems I	<i>pag.</i>	<i>paper#</i>
Deploying reconfigurable 3D scanning for complex anatomical measurements C. Lane <i>3dMD, Atlanta, USA</i>	9	#43
Laser triangulation system for the measurement of volume and color of wounds U. Pavlovic, M. Jezersek, J. Mozina <i>University of Ljubljana, Slovenia</i>	10	#41
Development of a BCCT quantitative 3D evaluation system through low cost solutions H.P. Oliveira ¹ , P. Patete ² , G. Baroni ² , J.S. Cardoso ¹ ¹ <i>Universidade do Porto, Portuga</i> ² <i>Politecnico di Milano, Italy</i>	16	#24
Technical Session 2: Body Scanning for Apparel I	<i>pag.</i>	<i>paper#</i>
Comparability between simulation and reality in apparel: A practical project approach from 3D-body scan to individual avatars and from 3D-simulation in vitya to fitted garments M. Ernst ¹ , A. Rissiek ² ¹ <i>Niederrhein University of Applied Sciences, Germany</i> ² <i>Human Solutions, Germany</i>	28	#50
Development of 3D virtual models and 3D construction methods for garments E.C. Hlaing, S. Krzywinski, H. Roedel <i>Technical University Dresden, Germany</i>	43	#09
The use of 3D anthropometric data for morphotype analysis to improve fit and grading techniques A. De Raeve, J. Cools, H. Bossaer <i>University College Ghent, Belgium</i>	52	#31
An analysis of digital 3D body imaging technology S.-H. Lin, K. Mammel <i>University of Hawaii at Manoa, USA</i>	58	#03
3D Body Scanning Technology for virtual design of system "body-clothes" V. Kuzmichev, N. Saharova, G. Chistoborodov <i>Ivanovo State Textile Academy, Russia</i>	66	#44
Technical Session 3: Digital Anthropometry I	<i>pag.</i>	<i>paper#</i>
Evaluating the automated alignment of 3D human body scans D.A. Hirshberg ³ , M. Loper ³ , E. Rachlin ³ , A. Tsoli ^{1,3} , A. Weiss ¹ , B. Corner ² , M.J. Black ^{1,3} ¹ <i>Brown University, USA</i> ² <i>U.S. Army Natick Soldier Research, USA</i> ³ <i>Max Planck Institute for Intelligent Systems, Germany</i>	76	#26

Health-related shape analysis of 3D body scanner data C. Lovato, C. Milanese, F. Piscitelli, C. Zancanaro, A. Giachetti <i>University of Verona, Italy</i>	87	#14
Selecting intrinsic landmarks in range scans J.L. Camp ^{1,2} , A. Goshtasby ² ¹ <i>Air Force Research Laboratory, USA</i> ² <i>Wright State University, USA</i>	95	#34
Applying a 3D body scanner to qualify the postures and direction of changes in human body by children example W. Sybilska, E. Mielicka <i>Textile Research Institute, Lodz, Poland</i>	104	#58
3D anthropometry and physical interaction modeling for persons with arthritis D.J. Feathers <i>Cornell University, USA</i>	113	#40
Technical Session 4: Scanning Technologies	<i>pag.</i>	<i>paper#</i>
Digitizing entire populations of consumers for smartphone applications D. Bruner <i>[TC]², USA</i>	114	#18
3D body measurements using active millimeter wave technology M.F. Karim, B. Luo, A.R. Leyman, I.R. Khan, K.W. Seah, L.C. Ong <i>I²R, Singapore</i>	116	#13
3D body scanning with one Kinect Y. Cui, D. Stricker <i>DFKI - Kaiserslautern University, Germany</i>	121	#07
Body trunk shape estimation from silhouettes by using homologous human body model S. Saito ¹ , M. Kochi ² , M. Mochimaru ² , Y. Aoki ² ¹ <i>Keio University, Tokyo, Japan</i> ² <i>Digital Human Research Center, AIST, Japan</i>	130	#22
Technical Session 5: Medical Applications	<i>pag.</i>	<i>paper#</i>
Real time optical patient surface motion monitoring during radiotherapy G. Price, J. Parkhurst, P. Sharrock, C. Moore <i>The Christie NHS Foundation Trust, UK</i>	138	#38
The application of the recent advances in stereophotogrammetry for the diagnosis and management of oro-facial deformities B. Khambay ¹ , X. Ju ² , T. Al-Anezi ¹ , A. Ayoub ² ¹ <i>Glasgow University, UK</i> ² <i>NHS Greater Glasgow and Clyde, UK</i>	145	#57
Criterion validity of whole body surface area equations: A comparison using 3D scanning N.D. Daniell, T. Olds, G. Tomkinson <i>University of South Australia, Australia</i>	149	#36

Technical Session 6: Body Scanning for Apparel II	<i>pag.</i>	<i>paper#</i>
3D Body Scanning – Utilization of 3D body data for garment and footwear design E. Kirchdoerfer, A. Mahr-Erhardt, S. Morlock <i>Hohenstein Institut fuer Textilinnovation, Germany</i>	150	#10
Shoe size recommendation system based on shoe inner dimension measurement D. Omrcen, A. Jurca <i>UCS Universal Customization System, Slovenia</i>	158	#12
Automated generation of human models from scan data in anatomically correct postures for rapid development of close-fitting, functional garments C. Meixner ¹ , S. Krzywinski ² ¹ <i>ETH Zurich, Switzerland</i> ² <i>ITM - TU Dresden, Germany</i>	164	#05
Comparative analysis between 3D visual fit and wearers' subjective acceptability Y.-A Lee ¹ , S.-M. Park ² ¹ <i>Iowa State University, USA</i> ² <i>Konkuk University, Korea</i>	174	#30
Technical Session 7: Human Body Scanning	<i>pag.</i>	<i>paper#</i>
Wonder and the digital double Brass Art: C. Lewis ¹ , K. Mojsiewicz ² , A. Pettican ³ ¹ <i>Manchester Metropolitan University, UK</i> ² <i>Edinburgh College of Art, Scotland, UK</i> ³ <i>University of Huddersfield, UK</i>	185	#49
Pattern-based face localization and online projector parametrization for multi-camera 3D scanning K. Ouji ¹ , M. Ardabilian ¹ , L. Chen ¹ , F. Ghorbel ² ¹ <i>LIRIS - Ecole Centrale de Lyon, France</i> ² <i>ENSI, Tunisia</i>	197	#27
Real-time 3D content creation of 3D human body using a handheld 3D imager and/or synchronized sensors platform S. Negry <i>Mantis Vision, Israel</i>	205	#06
Technical Session 8: Garment Draping Simulation	<i>pag.</i>	<i>paper#</i>
An online fitting simulation system of a garment using 3D body data R. Choi, C.-S. Cho <i>Hanshin University, Korea</i>	206	#04
Integrating 3D scanning data & textile parameters into virtual clothing E.J. Power, P.R. Apeagyei, A.M. Jefferson <i>Manchester Metropolitan University, UK</i>	213	#15
Posture, 3D real body, virtual try on: Towards fashion J.-M. Surville <i>LECTRA, France</i>	225	#53

The application of three-dimensional (3-D) body scanner in fabric drape assessment T. Mah ¹ , G. Song ² ¹ <i>Health Canada, Canada</i> ² <i>University of Alberta, Canada</i>	234	#37
Technical Session 9: Applications in Health and Sport	<i>pag.</i>	<i>paper#</i>
3D body scanning method for close-fitting garments in sport and medical applications O. Troynikov, E. Ashayeri <i>RMIT University, Australia</i>	239	#02
Body fat percentage extracted from 3-D scans for sports & medical science J. Balzulat ¹ , U. Botzenhardt ¹ , N. Bachl ² , A. Baca ² , M. Heller ² ¹ <i>Human Solutions, Germany</i> ² <i>University of Vienna, Austria</i>	249	#42
The effects of short-term exercise on anthropometric measurements T. Domina, P. Kinnicutt <i>Central Michigan University, USA</i>	255	#33
Defining area mass index (AMI) using 3D body scanning as an improvement of BMI E. Schlich ¹ , M. Schlich ² ¹ <i>Justus Liebig University Giessen, Germany</i> ² <i>University Koblenz-Landau, Germany</i>	262	#08
Shape completion and modeling of 3D foot shape while walking using homologous model fitting Y. Yoshida ¹ , S. Saito ¹ , Y. Aoki ¹ , M. Kouchi ² , M. Mochimaru ² ¹ <i>Keio University, Japan</i> ² <i>Digital Human Research Center, AIST, Japan</i>	270	#23
Technical Session 10: Body Scanning Systems	<i>pag.</i>	<i>paper#</i>
VITUS 3D body scanner M. Maurer <i>VITRONIC Dr.-Ing. Stein Bildverarbeitungssysteme, Germany</i>	277	#51
A portable and compact 3D body - 3D body scanner traveling type - M. Hayashi ¹ , H. Kameshima ¹ , Y. Nishio ¹ , Y. Sato ^{1,2} ¹ <i>Spacevision, Japan</i> ² <i>Keio University, Japan</i>	284	#39
New generation of 3D body scanning technologies – New possibilities for fashion and marketing J.-L. Rennesson <i>TELMAT Industrie, France</i>	286	#56

Technical Session 11: Medical Scanning Systems II	<i>pag.</i>	<i>paper#</i>
Breathing training with assistance of laser 3D measuring system K. Povsic ¹ , M. Flezar ² , J. Mozina ¹ M. Jezersek ¹ ¹ <i>University of Ljubljana, Slovenia</i> ² <i>University Clinic Golnik, Slovenia</i>	295	#35
Validation of a high-resolution 3D face scanner based on stereophotogrammetry L.M. Galantucci, F. Lavecchia, G. Percoco, S. Raspatelli <i>Politecnico di Bari, Italy</i>	303	#45
3D electromagnetic tomography: technology for simultaneous body scanning and biomedical imaging S. Semenov <i>Keele University, UK</i>	314	#11
Technical Session 12: Digital Anthropometry	<i>pag.</i>	<i>paper#</i>
3D Measurement of children - Shape GB - The UK National Childrenswear Survey R. Barnes <i>Select Research, UK</i>	315	#29
Groupes classes and measurements: Toward made to measure J.-M. Surville <i>LECTRA, France</i>	320	#47
Body ScanFIT system: identifying body shapes. An anthropometric survey carried out in 2010 by CME G. Figlie, L. Franceschi <i>Cad Modelling Ergonomics, Italy</i>	328	#32
Data compatibility analysis of 3D body scanning A. Vuruskan ^{1,2} , B. Seider ³ , U. Detering-Koll ¹ ¹ <i>Niederrhein University of Applied Sciences, Germany</i> ² <i>Izmir University of Economics, Turkey</i> ³ <i>Adidas Innovation Team, Germany</i>	338	#52
Author index	349	