

CONFERENCE PROGRAM



7th International Conference and Exhibition on 3D Body Scanning Technologies

Lugano, Switzerland, 30 Nov. - 1 Dec. 2016

Organized by HOMETRICA CONSULTING · Switzerland

www.3dbodyscanning.org/2016

Program Outline

7 th International Conference and Exhibition on 3D Body Scanning Technologies, Lugano, Switzerland, 30 Nov. - 1 Dec. 2016				
Time	Wednesday 30 th November 2016		Thursday 1 st December 2016	
08:00	Registration		Exhibition Setup	Registration
09:00	Opening Session		Exhibition	Technical Session 7 Digital Anthropometry & Ergonomics
10:00				Technical Session 8 Body Scanning for Apparel II
	Coffee Break			Coffee Break
11:00	Technical Session 1 Medical Scanning Systems	Technical Session 2 Body Scanning for Apparel I	Exhibition	Technical Session 9 Medical Applications II
12:00	Lunch Break			Technical Session 10 Body Modeling & Processing
13:00			Lunch Break	
14:00	Technical Session 3 Body Scanning for Health, Fitness, Sport		Exhibition	Technical Session 11 Scanning Methods & Technologies I
15:00				Technical Session 4 Body Scanning Systems I
16:00	Coffee Break			Coffee Break
17:00	Technical Session 5 Medical Applications I	Technical Session 6 Body Scanning Systems II	Exhibition Breakdown	Technical Session 13 Scanning Methods & Technologies II
18:00	Welcome Cocktail			Technical Session 14 Body Scanning for Apparel III
			Closing Session	

Conference Office



HOMETRICA CONSULTING - Dr. Nicola D'Apuzzo
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3D Body Scanning Technologies
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Wednesday 30th November 2016

08:00-09:30 **Registration** – Welcome Desk

09:30-10:30 **Opening Session** – Room B1

Session Chair: Dr. Nicola D'APUZZO
Hometrica Consulting, Switzerland

09:30 Welcome Speech from the Conference Director
Nicola D'APUZZO
Hometrica Consulting, Switzerland

09:50 World Premieres and First Time Public Announcements at the Conference and Exhibition
Size Stream (USA), 3dMD (UK/USA), botspot (Germany), ViALUX (Germany), Anatomi Metrix (Canada),
Human Solutions (Germany), Chishine 3D (China), Intel&IEEE-SA (USA)

10:30-11:00 **Coffee Break** – Foyer

11:00-12:30 **Technical Session 1: Medical Scanning Systems** – Room C

Session Chair: David STEFAN
Novaptus Systems Inc., USA

11:00 Medical Grade 3D Full Body Scanners: Design and Experience
P. ASWENDT, R. HÖFLING, M. SCHATZ
ViALUX Messtechnik + Bildverarbeitung GmbH, Chemnitz, Germany #05

11:22 Manu3 – Capture Anatomical Dimensions of the Hand in 30 Milliseconds
Jean-Pierre GIBEAULT
Anatomi Metrix Inc., Montreal QC, Canada

11:45 Face scanner and 3D DSD
Xiang ZHOU, Yuqin LI
Xi'an Chishine Optoelectronics Technology Co. Ltd., Xi'an, China

11:00-12:30 **Technical Session 2: Body Scanning for Apparel I** – Room B1

Session Chair: Prof Dr Hein DAANEN
VU University, The Netherlands

11:00 Adapted Performance Sportswear
Alexandra DE RAEVE, Simona VASILE
Fashion & Textiles Innovation Lab, University College Ghent, Ghent, Belgium #32

11:22 The Impact of the Outer Layers in Multi-Layer Clothing Systems
on the Distribution of the Air Gap Thickness and Contact Area
Agnes PSIKUTA¹, Annette MARK^{1,2}, Rene M. ROSSI¹
¹ Laboratory for Protection and Physiology, Empa - Swiss Federal Laboratories for Materials Science and Technology,
St. Gallen, Switzerland; ² Institute of Textile Technology and Process Engineering (ITV), Denkendorf, Germany #45

11:45 Harvesting Information from Temporal 3D Dense Surface Sequences
Chris LANE
3dMD Ltd., London, UK

12:30-14:30 **Lunch Break**

14:30-16:00 **Technical Session 3: Body Scanning for Health, Fitness, Sport** – Room C S. Chair: Dr J. FREELAND-GRAVES
University of Texas at Austin, USA

14:30 Body Scanning for Fitness, Wellness, and Health
Greg MOORE
Fit3D Inc., Redwood City CA, USA

14:52 New Tools for Body Image Analysis: A Modern Framework Using 3D Body Scanning
David B. STEFAN¹, David A. GILBERT²
1 Novaptus Systems Inc., Chesapeake, VA, USA;
2 The Hague Center for Cosmetic and Reconstructive Surgery, Norfolk, VA, USA #22

15:15 Changes in the Volume and Circumference of the Torso, Leg and Arm
after Cycling in the Heat Determined Using 3D Whole Body Scanners
Hein A.M. DAANEN^{1,2,3}, Koen LEVELS¹, Lisette VONK², Wesley BOSMAN¹, Yorick SCHNEPPER¹, Frank B. TER HAAR³
1 Department of Human Movement Sciences, Faculty of Behaviour and Movement Sciences, Vrije , Universiteit Amsterdam,
MOVE Research Institute Amsterdam, The Netherlands;
2 AMFI – Amsterdam Fashion Institute, Amsterdam, The Netherlands; 3 TNO, The Netherlands #09

15:38 Analysis of Body Mass Components in Soccer Players Aged 14 to 17 Years in Republic of Macedonia
Slobodan NIKOLIĆ, Ljudmila EFREMOVSKA, Jasmina PLUNČEVIĆ GLIGOROSKA, Vesela MALESKA IVANOVSKA
Institute for ME Physiology and Anthropology, Medical Faculty, Ss. Cyril and Methodius University (UKIM), Skopje, R. Macedonia #61

14:30-16:00 **Technical Session 4: Body Scanning Systems I** – Room B1 Session Chair: Dr Yannis DOUROS
Metal Ltd., UK

14:30 Photogrammetry - The Fastest Way to Rebuild the Reality
Manfred OSTERMEIER
botspot GmbH, Berlin, Germany

14:52 Dagubert - A Fully Automated and Self-Operated 3D Photo Studio
Florian TURSKY
3D Elements GmbH, Innsbruck, Austria

15:15 PORTAL: Engaging 3D Scanning
Maxim FEDYUKOV
Texel Inc., Moscow, Russia

16:00-16:30 **Coffee Break** – Foyer

16:30-18:30 **Technical Session 5: Medical Applications I** – Room C Session Chair: David STEFAN
Novaptus Systems Inc., USA

16:30 A Mobile, Multi Camera Setup for 3D Full Body Imaging in Combination
with Post-Mortem Computed Tomography Procedures
Sören KOTTNER¹, Lars C. EBERT¹, Garyfalia AMPANOZI¹, Marcel BRAUN², Michael J. THALI¹, Dominic GASCHO¹
1 University of Zurich, Institute of Forensic Medicine, Zurich, Switzerland; 2 Forensic Science Institute, Zurich, Switzerland #30

16:54 3D Scanning for Hand Orthotic Applications: A Comparative Assessment between Static and Real-Time Solutions
Paola VOLONGHI¹, Alberto SIGNORONI¹, Gabriele BARONIO²
1 Università degli Studi di Brescia, Dipartimento di Ingegneria dell'Informazione, Brescia, Italy;
2 Università degli Studi di Brescia, Dip. di Ingegneria Meccanica e Industriale, Brescia, Italy #52

17:18 Foot Abnormality Mapping using Statistical Shape Modelling
Kristina STANKOVIĆ¹, Femke DANCKAERS¹, Brian G. BOOTH¹,
Fien BURG², Saartje DUERINCK², Jan SIJBERS¹, Toon HUYSMANS¹
1 iMinds – Vision Lab, Dept. of Physics, University of Antwerp, Belgium; 2 RSscan International NV, Paal, Belgium #47

17:42 Laser Scanner Versus Stereophotogrammetry: A Three-Dimensional Quantitative Approach
for Morphological Analysis of Pubic Symphysis
Valentina PUCCIARELLI¹, Daniele Maria GIBELLI^{1,2}, Marina CODARI¹, Francesca Maria Emilia RUSCONI¹,
Annalisa CAPPELLA^{1,2}, Cristina CATTANEO^{1,2}, Chiarella SFORZA¹
1 LAFAS, Laboratorio di Anatomia Funzionale dell'Apparato Stomatognatico, Dipartimento di Scienze Biomediche per la Salute,
Università degli Studi di Milano, Milano, Italy;
2 LABANOF, Laboratorio di Antropologia e Odontologia Forense, Dipartimento di Scienze Biomediche per la Salute,
Università degli Studi di Milano, Milano, Italy #18

18:06 Application of 3D Scanning in Prosthetic & Orthotic Clinical Practice
Jiri ROSICKY^{1,2,3}, Ales GRYGAR^{1,2}, Petr CHAPCAK^{1,2}, Tomas BOUMA^{1,2}, Jan ROSICKY^{1,2}
1 Invent Medical Group s.r.o., Ostrava, Czech Republic; 2 ING corporation s.r.o., Frydlant nad Ostravici, Czech Republic;
3 Ortopedická protetika Frydek-Místek s.r.o., Frydek-Místek, Czech Republic #36

16:30 Size Stream Technologies for 2017 and Beyond
David BRUNER
Size Stream LLC, Cary NC, USA

16:54 Learn How We Are Re-Shaping the Fitness Industry
Raj SAREEN
Styku, Los Angeles CA, USA

17:18 Bodyscanning as an Enabler for Digital Fashion Process
Peter BERNINGER, Anton PREISS, Andreas SEIDL
Human Solutions GmbH, Kaiserslautern, Germany

17:42 Temporal 3D Body Surface Imaging (4D) to Support Product Innovation in Wearable Technologies
Chris LANE
3dMD Ltd., London, UK

18:06 3D Scanning Platform for Human Body for Best Match Fitting
Michel BABIN
TechMed 3D, Lévis QC, Canada

18:30-20:30 **Welcome Cocktail**

Thursday 1st December 2016

08:00-09:00 **Registration** – Welcome Desk

09:00-10:30 **Technical Session 7: Digital Anthropometry & Ergonomics** – Room C

Session Chair: Dr Gregor HARIH
University of Maribor, Slovenia

09:00 Digital Assessment of Anthropometric and Kinematic Parameters for the Individualization of Direct Human-Robot Collaborations
Dominik BONIN¹, Lukas STANKIEWICZ², Carsten THOMAS³, Jochen DEUSE², Bernd KUHNENKÖTTER³, Sascha WISCHNIEWSKI¹
1 Unit Human Factors, Ergonomics, Federal Institute for Occupational Safety and Health (BAuA), Dortmund, Germany;
2 Institute of Production Systems, TU Dortmund University, Dortmund, Germany;
3 Chair of Production Systems, Ruhr-Universität Bochum, Bochum, Germany #27

09:22 Thickness of Compressed Hair Layer: A Pilot Study in a Manikin
Stijn VERWULGEN¹, Jochen VLEUGELS¹, Daniël LACKO¹, Erik HARING¹, Guido DE BRUYNE, Toon HUYSMANS²
1 Department of Product Development, Fac. of Design Sciences, University of Antwerp, Belgium;
2 iMinds-Vision Lab, Dept. of Physics, University of Antwerp, Belgium #44

09:45 Using 3D Scanning for Improved Helmet Design
Simone MORLOCK, Andreas SCHENK, Anke KLEPSE, Andreas SCHMIDT
Hohenstein Institut für Textilinnovation gGmbH, Bönnigheim, Germany #12

09:00-10:30 **Technical Session 8: Body Scanning for Apparel II** – Room B1

Session Chair: Prof Slavenka PETRAK
University of Zagreb, Croatia

09:00 Virtual Design of System "Body-Dress" Improving with Scanning Technologies
Victor E. KUZMICHEV^{1,3}, Jiaqi YAN², Shichao ZHANG²
1 Ivanovo State Polytechnic University, Department of Garment Design, Ivanovo, Russia; 2 Wuhan Textile University, School of Fashion, Wuhan, China; 3 Vladivostok State University of Economics and Service, Vladivostok, Russia #41

09:22 Kidsize: Always Get the Right Size!
Alfredo BALLESTER, Ana PIÉROLA, Eduardo PARRILLA, Jordi URIEL, Paola PIQUERAS, Beatriz NÁCHER, Julio VIVAS, Cristina PÉREZ, Silvia SAN JERÓNIMO, Sandra ALEMANY
Instituto de Biomecánica de Valencia (IBV), Universidad Politécnica de Valencia, Valencia, Spain #34

09:45 Automatic Morphological Classification with Case-Based Reasoning
Thomas FISCHER¹, Alexander ARTSCHWAGER¹, Konrad PFLEIDERER¹, Anke RISSIEK², Magdalena MANDALKA², Andreas SEIDL², Rainer TRIEB²
1 Center for Management Research, German Institutes of Textile and Fiber Research Denkendorf, Denkendorf, Germany;
2 Human Solutions GmbH, Kaiserslautern, Germany #48

10:08 Rapid Body Scanning Technology for a Virtual Mass Customization Process in Garment Industry
Michael ERNST^{1,2}, Monika BOEHM¹, Ute DETERING-KOLL¹, Deidre WINDVOGEL²
1 Niederrhein University of Applied Sciences, Germany; 2 Cape Peninsula University of Technology, South Africa #43

10:30-11:00 **Coffee Break** – Foyer

11:00-12:30 Technical Session 9: Medical Applications II – Room CSession Chair: Dr Jeanne FREELAND-GRAVES
University of Texas at Austin, USA

- 11:00 3D Morphometric Evaluation of Craniofacial Features in Adult Subjects with Marfan Syndrome
Claudia DOLCI¹, Valentina PUCCIARELLI¹, Marina CODARI¹, Susan MARELLI², Giuliana TRIFIRÒ³, Alessandro PINI², Chiarella SFORZA¹
1 Dipartimento di Scienze Biomediche per la Salute, Università degli Studi di Milano, Milano, Italy; 2 Centro Malattie Rare, MarfanClinic, ASST Fatebenefratelli-Sacco, Milano, Italy; 3 U.O. Pediatria, ASST Rhodense, Rho (Milano), Italy #17
- 11:22 The Application of 3D Image Acquisition Systems to Palatal Rugae: A Technical Improvement for Personal Identification?
Daniele M. GIBELLI^{1,2}, Danilo DE ANGELIS², Riccardo LUPI³, Paolo DANESINO³, Mike MARIC³, Valentina PUCCIARELLI¹, Chiarella SFORZA¹
1 Dipartimento di Scienze Biomediche per la Salute, Università degli Studi di Milano, Milano, Italy;
2.LABANOF, Laboratorio di Antropologia e Odontologia Forense, Dipartimento di Scienze Biomediche per la Salute, Università degli Studi di Milano, Milano, Italy; 3.Università degli Studi di Pavia, Pavia, Italy #19
- 11:45 Practical Advice: Navigating the Landscape for Using 3D Body Scanners in a Medical Environment.
Do's, Don'ts and "Maybes."
David B. STEFAN¹, David A. GILBERT²
1 Novaptus Systems Inc., Chesapeake, VA, USA; 2 The Hague Center for Cosmetic Surgery, Norfolk, VA, USA #23
- 12:08 Using Mobile 3D Scanning Systems for Objective Evaluation of Form, Volume, and Symmetry in Plastic Surgery: Intraoperative Scanning and Lymphedema Assessment
Konstantin Christoph KOBAN, Riccardo Enzo GIUNTA
Department of Hand Surgery, Plastic Surgery and Aesthetic Surgery, Ludwig-Maximilians-University, Munich, Germany #39

11:00-12:30 Technical Session 10: Body Modeling & Processing – Room B1Session Chair: Dr Junfeng PENG
Decathlon S.A., France

- 11:00 A Parametric Model of Shoulder Articulation for Virtual Assessment of Space Suit Fit
K. Han KIM¹, Karen S. YOUNG¹, Yaritza BERNAL², Abhishektha BOPPANA³,
Linh Q. VU², Elizabeth A. BENSON⁴, Sarah JARVIS⁴, Sudhakar L. RAJULU⁵
1 Leidos Inc., Houston TX, USA; 2 Geologics Corp., Houston TX, USA; 3 National Space Biomedical Research Inst., Houston TX, USA;
4 MEI Technologies Inc., TX, USA; 5 NASA Johnson Space Center, TX, USA , USA #38
- 11:22 Development of a Finite Element Digital Human Hand Model
Gregor HARIH¹, Mitsunori TADA²
1 Laboratory for Intelligent CAD systems, Faculty for Mechanical Engineering, University of Maribor, Maribor, Slovenia;
2 Digital Human Research Group, Human Informatics Research Institute, National Institute of Advanced Industrial Science and Technology, Japan #14
- 11:45 Cloud-Based Communications for 3D Data
Kaye HOPE
ShareMy3D, Oslo, Norway
- 12:08 IEEE Standards Association Initiative for Accelerating Immersive Shopping Experiences by Harnessing Cutting Edge Research & Innovation for 3D Body Processing Technologies
Michael STAHL¹, Luciano C. OVIEDO², Rudi SCHUBERT³
1 Intel Israel Ltd., Jerusalem, Israel; 2 Intel Corp., Chandler AZ, USA; 3 IEEE-SA, Piscataway NJ, USA

12:30-14:00 Lunch Break**14:00-16:00 Technical Session 11: Scanning Methods & Technologies I – Room C**S. Chair: Dr Kathleen ROBINETTE
Magic Leap Inc., USA

- 14:00 Body Part Modeling on the Phone
Ioannis MARRIGGIS, Olivier SAURER, Petri TANSKANEN
astrivis, Zurich, Switzerland #29
- 14:24 Photorealistic Texturing of Human Busts Reconstructions
Christoph HEINDL, Sharath Chandra AKKALADEVI, Harald BAUER
PROFACTOR GmbH, Steyr, Austria #13
- 14:48 Accurate Irritation-Free 3D Scanning of Human Face and Body Sequences
Christian BRÄUER-BURCHARDT¹, Anika BRAHM¹, Christian RULFF¹, Stefan HEIST¹, Peter KÜHMSTEDT¹, Gunther NOTNI^{2,1}
1 Fraunhofer IOF Jena, Jena, Germany; 2 Technical University Ilmenau, Ilmenau, Germany #15
- 15:12 QuantaCorp: Silhouette Based Body Measurement Using Low-Cost Devices
Alexander VANDELDE
QuantaCorp, Sint-Denijs Westrem, Belgium

14:00-16:00 Technical Session 12: Anthropometric Studies & Surveys – Room B1Session Chair: Alexandra DE RAEVE
University College Ghent, Belgium**14:00 The Cycle of the Shape Descriptor Suite: When do People Become Overweight?**David B. STEFAN¹, David A. GILBERT²

1 Novaptus Systems Inc., Chesapeake, VA, USA; 2 The Hague Center for Cosmetic Surgery, Norfolk, VA, USA #24

14:24 XL Plus mMen - New Data on Garment Sizes

Simone MORLOCK, Andreas SCHENK, Anke KLEPSEK, Andreas SCHMIDT

Hohenstein Institut für Textilinnovation gGmbH, Bönnigheim, Germany #11

14:48 Novel Anthropometry Based on 3D-Bodyscans Applied to a Large Population Based CohortHenry LÖFFLER-WIRTH^{1,2}, Edith WILLSCHEK^{1,2}, Peter AHNERT^{2,3}, Kerstin WIRKNER²,
Christoph ENGEL^{2,3}, Markus LOEFFLER^{1,2,3}, Hans BINDER^{1,2,3}

1 Interdisciplinary Centre for Bioinformatics, Leipzig University, Leipzig, Germany;

2 LIFE, Leipzig Research Center for Civilization Diseases, Leipzig University, Leipzig, Germany;

3 Institute for Medical Informatics, Statistics and Epidemiology, Leipzig University, Leipzig, Germany #56

15:12 The Development of a National Anthropometric Data Bank for Saudi Adults: The Initial Stage

Moudi ALMOUSA

College of Food Sciences and Agriculture, King Saud University, Riyadh, Saudi Arabia #55

15:36 An Attempt for Developing Albanian Anthropometric System within a Pilot ProjectT. SPAHIU¹, E. SHEHI¹, E. PIPERI²

1 Faculty of Mechanical Engineering, Textile and Fashion Department, Polytechnic University of Tirana, Tirana, Albania;

2 Faculty of Mechanical Engineering, Department of Production and Management, Polytechnic University of Tirana, Albania #25

16:00-16:30 Coffee Break – Foyer**16:30-18:00 Technical Session 13: Scanning Methods & Technologies II – Room C**S. Chair: Dr Alberto SIGNORONI
Università degli Studi di Brescia, Italy**16:30 Multisensor Optical-Electronic Device for Calculation of Surface Parameters of the 3D Curvilinear Object**

Konstantin KARAVAEV, Maxim I. TRUPHANOV

Silver Research Laboratory, Los Angeles CA, USA #10

16:52 Software Synchronization of Projector and Camera for Structured Light 3D Body ScanningTomislav PETKOVIĆ¹, Tomislav PRIBANIĆ¹, Matea ĐONLIĆ¹, Nicola D'APUZZO²

1 University of Zagreb, Faculty of Electrical Engineering and Computing, Zagreb, Croatia;

2 Hometrica Consulting, Ascona, Switzerland #16

17:15 INBODY: Instant Photogrammetric 3D Body ScannerStanislao GRAZIOSO¹, Mario SELVAGGIO¹, Giuseppe DI GIRONIMO¹, Roberto Riccardo RUGGIERO²

1 Department of Industrial Engineering, University of Naples "Federico II", Naples, Italy;

2 Ortopedia Ruggiero srl, Cardito, Italy #53

16:30-18:00 Technical Session 14: Body Scanning for Apparel III – Room B1Session Chair: Prof Dr Michael ERNST
Niederrhein University, Germany**16:30 From 3D Scan to Best Fit Products – A Cloud-Based Solution for Fashion and Workwear**

Anke RISSIEK, Bettina SEIDER, Ulrich BOTZENHARDT, Anton PREISS, Andreas SEIDL

Human Solutions GmbH, Kaiserslautern, Germany #64

16:52 Analysis of Tight Fit Clothing 3D Construction Based on Parametric and Scanned Body ModelsMaja MAHNIC NAGLIC¹, Slavenka PETRAK¹, Zoran STJEPANOVIĆ²

1 University of Zagreb, Faculty of Textile Technology, Zagreb, Croatia;

2 University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia #49

17:15 Study on the Basic Pattern of Man's Trousers in Southwest Area Based on 3D Scanning Data

Qin LI, Xu LI, Longlin ZHANG

College of Textile & Garment, Southwest University, Chongqing, China #20

17:38 The Research on 3D Numerical Control Modeling Method of Lapel CollarXu LI^{1,3}, LinXu PAN¹, Huanyun WEI², Li ZHOU^{1,2}

1 College of Textile & Garment, Southwest University, Chongqing, China;

2 Chongqing Biomass Fiber Materials and Modern Textile Engineering Technology Research Center, Chongqing, China;

3 1981 Fashion Design Studio, ChongQing, China #21

18:00-18:15 Closing Session – Room B1**18:00 Closing speech and announcements for 2017 from the conference director**

Nicola D'APUZZO

Hometrica Consulting, Switzerland