



Asian Workshop on  
**3D Body Scanning Technologies**  
Tokyo, Japan, 17-18 April 2012

Organized by HOMETRICA CONSULTING - Dr. Nicola D'Apuzzo , [www.3dbodyscanning.org/A2012](http://www.3dbodyscanning.org/A2012)

Program of the  
**Asian Workshop on  
3D Body Scanning Technologies**  
Tokyo, Japan, 17-18 April 2012

**Organizer**

Hometrica Consulting  
Dr. Nicola D'Apuzzo  
Ascona/Zurich, Switzerland



[www.hometrica.ch](http://www.hometrica.ch)

**Hosting Institute**

AIST  
Digital Human Research Center  
Tokyo, Japan



 **AIST** National Institute of  
Advanced Industrial Science and Technology

**Digital Human Research Center**

[www.dh.aist.go.jp](http://www.dh.aist.go.jp)



# Asian Workshop on 3D Body Scanning Technologies

Tokyo, Japan, 17-18 April 2012

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## Workshop Program

### Program Outline

Asian Workshop on 3D Body Scanning Technologies, Tokyo, Japan, 17-18 April 2012					
Time	Tuesday 17 <sup>th</sup> April 2012		Wednesday 18 <sup>th</sup> April 2012		
08:00	Setup	Exhibition Setup	Setup	Exhibition Setup	
09:00	Registration	Exhibition	Registration	Exhibition	
10:00	Opening Session		Technical Session 4 Processing of Body Scan Data		
	Break		Coffee Break		
11:00	Technical Session 1 Full Body Scanning Systems		Technical Session 5 Human Body Sizing Surveys		
12:00	Lunch Break / Visit Exhibition		Lunch Break / Visit Exhibition		
13:00					
14:00	Technical Session 2 Body Scanning for Medicine and Health		Technical Session 6 Body Scanning for Apparel		
15:00	Coffee Break		Coffee Break		Exhibition Breakdown
16:00	Technical Session 3 Body Scanning Systems and Technologies		Technical Session 7 Digital Anthropometry		
17:00			Closing Session with Discussion		
18:00	Buffet Dinner Party				

### Tuesday 17<sup>th</sup> April 2012

08:30-10:00 **Registration** – Welcome desk

10:00-10:30 **Opening Session**



Welcome speech from the workshop director  
Nicola D'Apuzzo  
Hometrica Consulting, Zurich/Ascona, Switzerland



Welcome speech from the director of the Digital Human Research Center  
Masaaki Mochimaru  
Digital Human Research Center, AIST, Tokyo, Japan

10:30-11:00 **Break**

11:00-12:30 **Technical Session 1: Full Body Scanning Systems**

Chairman: Dr. Igor Goncharenko  
3D Incorporated (Japan)



#29

KX-16: 3D body scanning using low cost depth sensors

David Bruner

[TC]<sup>2</sup> Corp., Cary (NC), USA



#08

VITUS 3D body scanner

Markus Maurer

VITRONIC Dr.-Ing. Stein Bildverarbeitungssysteme GmbH, Wiesbaden, German



#14

A portable 3D body scanner and its application

Hideto Kameshima<sup>1</sup>, Masaki Hayashi<sup>1,2</sup>, Yuji Nishio<sup>1</sup>, Yukio Sato<sup>2</sup>

<sup>1</sup> Spacevision Inc., Tokyo, Japan;

<sup>2</sup> Keio University, Kanagawa, Japan



#33

The ubiquity of scanning technologies

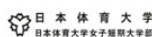
Bob Kutnick

Me-Allity, Unique Solutions Ltd., Dartmouth (NS), Canada

12:30-14:45 **Lunch Break / Visit Exhibition**

14:45-16:00 **Technical Session 2: Body Scanning for Medicine and Health**

Chairman: Dr. Makiko Kouchi  
DHRC AIST (Japan)



HAMAMATSU

#05

Applications of 3D body scanning technology to human anthropometry: body surface area and body volume measurements in the fields of health and sports sciences

Kazuo Funato<sup>1</sup>, Noriko Hakamada<sup>1</sup>, Hidehiko Nagashima<sup>2</sup>, Chiyoharu Horiguchi<sup>2</sup>

<sup>1</sup> Laboratory for Human Movement Sciences, Nippon Sport Science University, Yokohama, Japan;

<sup>2</sup> Hamamatsu Photonics K.K., Japan



#26

Using 1D and 2D anthropometric data to develop a biofidelic breast cancer patient simulator

Daisy Veitch<sup>1</sup>, Rachel Dawson<sup>2</sup>, Harry Owen<sup>2</sup>, Chris Leigh<sup>1</sup>

<sup>1</sup> Sharp Dummies, Belair (SA), Australia;

<sup>2</sup> Flinders Medical Centre, Bedford Park (SA), Australia



#02

Analysis of 3D foot shape features in elderly with hallux valgus using multi-dimensional scaling method

Sung Hyek Kim

Health Science University, Yamanashi, Japan

16:00-16:30 **Coffee Break**

16:30-18:30 **Technical Session 3: Body Scanning Systems and Technologies**

Chairman: Prof. Yukio Sato  
Keio University (Japan)



#06

Artec 3D body scanning systems

Tomohide Imada

DataDesign Co.Ltd., Nagoya, Japan



#30

3D foot scanning system INFOOT - Automated anatomical landmark detection and labeling

Kozo Kimura<sup>1</sup>, Tsuneaki Utsumi<sup>1</sup>, Makiko Kouchi<sup>2</sup>, Masaaki Mochimaru<sup>2</sup>

<sup>1</sup> I-Ware Laboratory Co.Ltd., Osaka, Japan;

<sup>2</sup> Digital Human Research Center, National Institute of Advanced Industrial Science and Technology, Tokyo, Japan



#12

Human body measurement by digital photogrammetry system

Nobuo Kochi, Kazuo Kitamura, Hiroto Watanabe, Takayuki Noma, Mitsuharu Yamada

Imaging and Measuring Laboratory, R&D Center, Topcon Corporation, Tokyo, Japan



#32

Real-time 3D body scanning

Minoru Niimura<sup>1</sup>, Matthew W. Bellis<sup>1</sup>, Daniel L. Lau<sup>2</sup>

<sup>1</sup> Seikowave KK., Kawasaki, Japan;

<sup>2</sup> University of Kentucky, Lexington (KY), USA



#31

Development of low cost foot scanner using foot model

Ameersing Luximon<sup>1</sup>, Zhang YiFan<sup>1</sup>, Ma Xiao<sup>1</sup>, Yan Luximon<sup>2</sup>

<sup>1</sup> Institute of Textiles & Clothing, Hong Kong Polytechnic University, Hong Kong;

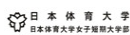
<sup>2</sup> School of Design, Hong Kong Polytechnic University, Hong Kong

18:30-20:00 **Buffet Dinner Party**

Reservation/registration required

09:15-10:45 **Technical Session 4: Processing of Body Scan Data**

Chairman: Dr. Peng Li  
US Army Natick RDEC (USA)



#04

Estimation of center of gravity obtained from 3D whole body scanning anthropometry method  
*Noriko Hakamada<sup>1</sup> and Kazuo Funato<sup>2</sup>*

<sup>1</sup> Nippon Sport Science University, Tokyo, Japan;  
<sup>2</sup> Graduate School of Health and Sport Science, Nippon Sport Science University, Tokyo, Japan



#19

Shape map method for 3D body scanning information storage

*Peng Sixiang<sup>1</sup>, Chan Chee-kooi<sup>1</sup>, Ameersing Luximon<sup>1</sup>, W.H. Ip<sup>2</sup>*  
<sup>1</sup> Hong Kong Polytechnic University, Institute of Textiles & Clothing, Hong Kong;  
<sup>2</sup> Hong Kong Polytechnic University, Department of Industrial and Systems Engineering, Hong Kong



#22

Rules research of neck curves for 3D female body mannequin

*Junqiang Su<sup>1,2,3</sup>, Bingfei Gu<sup>1,2</sup>, Guolian Liu<sup>1,2</sup>*  
<sup>1</sup> National Engineering Laboratory for Modern Silk, Suzhou, Jiang Su, China;  
<sup>2</sup> College of Textile and Clothing Engineering, Soochow University, Suzhou, Jiang Su, China;  
<sup>3</sup> Changzhou Textile & Garment Institute, Jiang Su, China



#28

Using body scan technology (computer-aided anthropometry) to measure breast volume

*Daisy Veitch<sup>1</sup>, Karen Burford<sup>2</sup>, Phil Dench<sup>3</sup>, Nicola Dean<sup>2</sup>, Philip Griffin<sup>2</sup>*  
<sup>1</sup> Sharp Dummies, Belair (SA), Australia; <sup>2</sup> Flinders Medical Centre, Bedford Park SA, Australia;  
<sup>3</sup> headus (metamorphosis) Pty Ltd, Osborne Park (WA), Australia

10:45-11:15 **Coffee Break**

11:15-12:30 **Technical Session 5: Human Body Sizing Surveys**

Chairman: Bob Kutnick  
Unique Solutions Ltd. (Canada)



#24

National anthropometric surveys in china

*Taijie Liu<sup>1</sup>, Chuzhi Chao<sup>1</sup>, Chaoyi Zhao<sup>1</sup>, Recharad Zhao<sup>2</sup>*  
<sup>1</sup> China National Institute of Standardization, Beijing, China;  
<sup>2</sup> Leatech Co. Ltd., Beijing, China



#07

Anthropometric study on Chinese head

*Roger MacLaren Ball, Yan Luximon, Ho Chi Eric Chow*  
School of Design, The Hong Kong Polytechnic University, Hong Kong



#25

Size survey - Process chain and available products

*Anton Preiss, Ulrich Botzenhardt*  
Human Solutions GmbH, Keiserslautern, Germany

12:30-14:30 **Lunch Break / Visit Exhibition**

14:30-16:00 **Technical Session 6: Body Scanning for Apparel**

Chairman: Dr. David Bruner  
ITCF (USA)



#11

Analysis of three dimensional torso shape and bodice pattern shape of young Japanese Women

*Keiko Watanabe*  
Kyoto Women's University, Kyoto, Japan



#27

Waist measurements compared: definitions (ISO vs CAESAR) and instruments (manual vs 3D scanned data)

*Daisy Veitch*  
Sharp Dummies, Belair (SA), Australia



#34

In pursuit of the IDEAL fit

*Joanna Gould-Thorpe*  
Me-Ality, Unique Solutions Ltd., Dartmouth (NS), Canada



#13

Made-to-measure jeans

*Pirjo Elbrecht*  
Nomo Jeans Corp., Helsinki, Finland

16:00-16:30 **Coffee Break**

16:30-17:45

**Technical Session 7: Digital Anthropometry**Chairman: Prof. Kazuo Funato  
Nippon Sport Science University (Japan)

A protocol for evaluating the accuracy of 3D body scanners – Landmark locations and surface shape  
*Makiko Kouchi*<sup>1</sup>, *Masaaki Mochimaru*<sup>1</sup>, *Bruce Bradtmiller*<sup>2</sup>, *Hein Daanen*<sup>3</sup>, *Peng Li*<sup>4</sup>, *Beatriz Nacher*<sup>5</sup>, *Yunja Nam*<sup>6</sup>  
<sup>1</sup> Digital Human Research Center, National Institute of Advanced Industrial Science and Technology, Tokyo, Japan;  
<sup>2</sup> Anthrotech Inc., Yellow Springs (OH), USA; <sup>3</sup> TNO, Soesterberg, The Netherlands; <sup>4</sup> US Army, Natick (MA), USA;  
<sup>5</sup> IBV, Universidad Politecnica de Valencia, Spain; <sup>6</sup> Seoul National University, S. Korea



Automatic measurement of dimensions of 3D foot scan data  
*Jinkyou Son*, *Seung-Yeob Baek*, *Kunwoo Lee*  
 Human Centered CAD Laboratory, Seoul National University, S. Korea



Web-based human body modeling by restricted number of anthropometric data  
*Igor Goncharenko*<sup>1</sup>, *Heihachi Ueki*<sup>1</sup>, *Katsuaki Takashiba*<sup>1</sup>, *Masaaki Mochimaru*<sup>2</sup>,  
*Makiko Kouchi*<sup>2</sup>, *Satoko Usui*<sup>3</sup>, *Masakazu Odahara*<sup>3</sup>, *Toru Sekizuka*<sup>1</sup>  
<sup>1</sup> I-Net Corp., Tokyo, Japan;  
<sup>2</sup> AIST, Tokyo, Japan;  
<sup>3</sup> Nihon Unisys Ltd., Tokyo, Japan

17:45-18:30

**Closing Session with Discussion**Chairman: Dr. Masaaki Mochimaru  
DHRC AIST (Japan)

Closing speech and announcements for 3D Body 2012  
*Nicola D'APUZZO*  
 Hometrica Consulting, Zurich/Ascona, Switzerland



Discussion on standards for validation methods of 3D body scanners  
 Moderator: *Masaaki Mochimaru*  
 Digital Human Research Center, AIST, Tokyo, Japan

**Exhibitors**

The workshop is accompanied by a technical exhibition which allows manufacturers of scanning equipment to demonstrate live their products to all participants. The following exhibitors are participating:

**DataDesign (Japan) – [www.datadesign.co.jp](http://www.datadesign.co.jp)**

DataDesign is a solutions provider specialized in 3D CAD/CAM, 3D scanning, 3D data processing and 3D printing. DataDesign is commercial partner of Artec Group Inc. (USA) and will demonstrate Artec's 3D scanning equipment at the workshop exhibition.

**VITRONIC (Germany) – [www.vitronic.com](http://www.vitronic.com)**

VITRONIC, a world leading organizations in the field of machine vision, is developer and manufacturer of body scanning systems employed by Human-Solutions. At the exhibition, VITRONIC will demonstrate its 3D full body scanner VITUS.

**SpaceVision (Japan) – [www.space-vision.jp](http://www.space-vision.jp)**

SpaceVision is a leading manufacturer of innovative 3D imaging solutions used in various application fields. SpaceVision will demonstrate at the workshop exhibition the world's smallest, lightest and fastest 3D body scanner.

**Beijing Leatech (China) – [www.leatech.net](http://www.leatech.net)**

Beijing Leatech is a leading trading company for 3D human body technology in China, dedicated in the garment, automotive and ergonomic research industry. It provides solutions by integrating worldwide 3D human body technology.

**[TC]<sup>2</sup> Corp. (USA) – [www.tc2.com](http://www.tc2.com)**

[TC]<sup>2</sup> is a world leader in 3D body scanning hardware and software. [TC]<sup>2</sup> provides 3D body scanning solutions in apparel, virtual fashion, health/fitness, medical, gaming, and online virtual worlds applications. The new low cost full body scanner KX-16 will be public demonstrated at the exhibition for the first time.

**I-Ware Laboratory (Japan) – [www.iwl.jp](http://www.iwl.jp)**

I-Ware Laboratory is a pioneer and world leader in 3D foot scanning hardware and software. At the exhibition of the workshop, I-Ware Laboratory will demonstrate its 3D foot scanning solutions.

**Seikowave (Japan) – [www.seikowave.com](http://www.seikowave.com)**

Seikowave is developing 3D imaging technologies targeted at healthcare applications and other sectors. Seikowave will demonstrate the real-time structured light body measurement system.

## Workshop Highlights

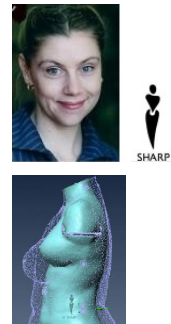
### Invited Speaker

#### Ms. Daisy Veitch, founder and CEO of SHARP Dummies (Australia)

SHARP Dummies was founded in Adelaide in 1999 by Ms Daisy Veitch, winner of the Australian Wool Corporation's Young Designer of the Year Award and the Queen Elizabeth II Silver Jubilee Award for Young Australians. Her experiences include all stages of garment production - from design to the finished product.

Along with running SHARP Dummies, Daisy is involved in a variety of projects, including lecturing in anthropometry and industrial design at the University of South Australia; consulting to Flinders Medical Centre; and guest lecturing and speaking to various charities. Daisy has also been engaged by the Australian government to write a report on the use of anthropometry by designers in the Australian workplace.

The workshop program features three presentations of Ms. Daisy Veitch with different topics related to medical applications, anthropometry and apparel.



### Closing Session with Discussion

Wednesday, 18:00-19:00

The workshop concludes with a discussion on "Standards for Validation Methods of 3D Body Scanners". The discussion during the closing session is moderated by Dr. Masaaki Mochimaru, deputy director of the Digital Human Research Center (DHRC) of the National Institute of Advanced Industrial Science and Technology (AIST) and chairman of the ISO Technical Commission TC159/SC3 on Ergonomics-Anthropometry and biomechanics.



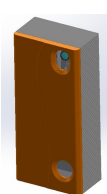
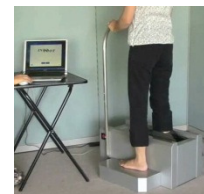
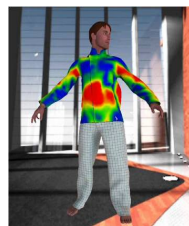
### Technical Exhibition

In the parallel technical exhibition, seven manufacturers and resellers of equipment demonstrate live their 3D body scanning systems and software solutions.

Different scanning technologies are represented: laser scanning, white light scanning, real-time scanning, etc.

Different systems will be shown: full body scanners, foot scanners, modular scanning systems, hand-held scanners and software solutions.

The attendees will have to possibility to test live the systems and to meet and discuss directly with the manufacturers and resellers.



### International Premieres at the Technical Exhibition

#### [TC]² (USA)

Worldwide public demonstration debut of the new low cost full body scanner KX-16 of [TC]²

[TC]² (USA) announced on February 29th the availability of its next generation full body scanner, the KX-16. It is a significant day in the history of 3D body scanning as the \$10,000 price point is broken for the first time with a full body coverage, full featured, changing-room sized, color commercial body scanning product with worldwide availability. The KX-16 leverages the emergence of low cost 3D scanning sensors, like the Microsoft XBOX Kinect sensor which utilizes technology from Primesense Corporation.

Its worldwide public demonstration debut will take place at the exhibition of the Asian Workshop on 3D body scanning technologies.

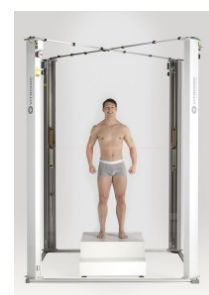


#### VITRONIC (Germany)

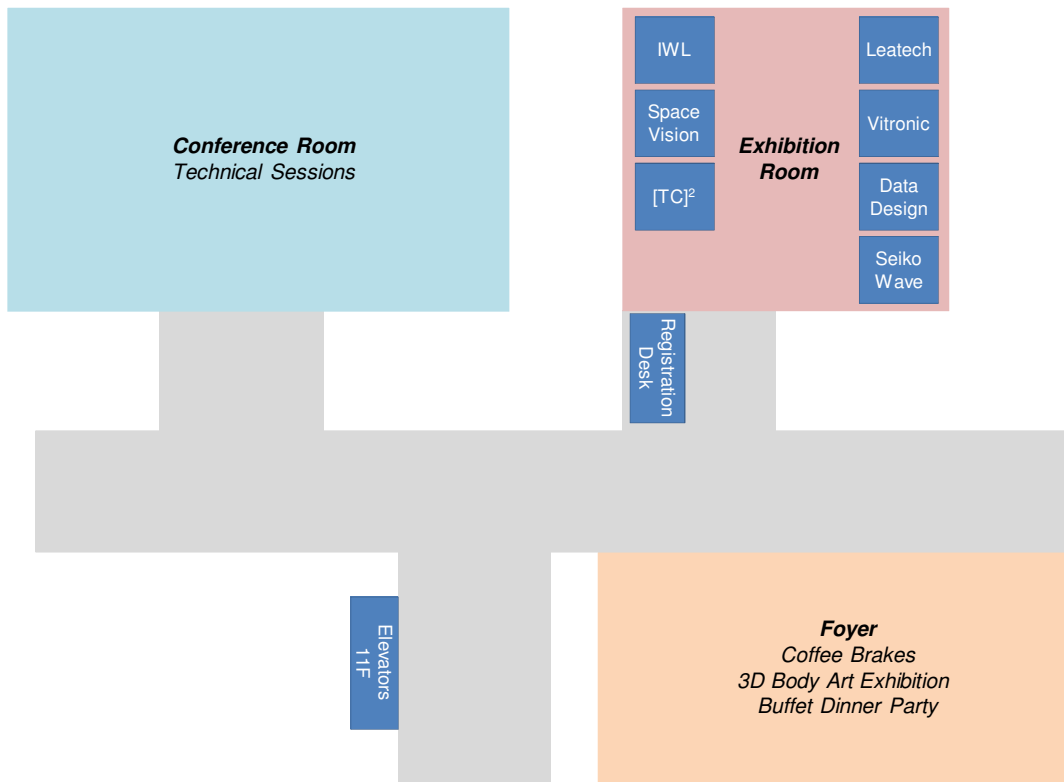
VITRONIC presents the VITUS 3D Body Scanner in Japan - A precise 3D image in just 12 seconds

Reliable and highly accurate raw data is needed to use 3D images of a person or object, for example for body measurement. The VITUS<sup>smart</sup> body scanner from VITRONIC generates an accurate 3D image during a scan of only 12 seconds. The VITUS<sup>smart</sup> body scanner is used for manufacturing tailor-made garments, collecting anthropometric data for medicine and orthopedics, assessing occupational groups and in support and training for athletes, as well as providing raw data for virtual reality projects. This broad application spectrum is made possible by the scanner's high accuracy, proven in studies, and its performance.

VITRONIC will present the VITUS<sup>smart</sup> body scanner at the Asian Workshop on 3D Body Scanning Technologies .



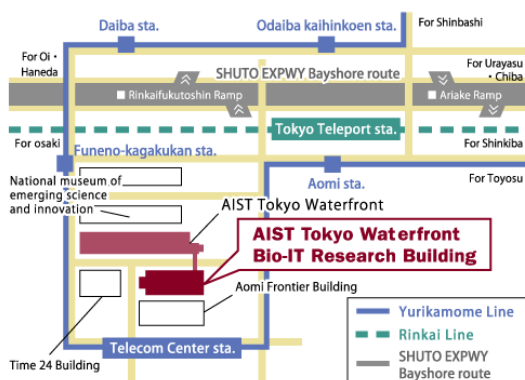
## Workshop and Exhibition Plan



## Contact Information:

The workshop and exhibition take place at the 11<sup>th</sup> floor of AIST Bio-IT Research Building

Workshop venue: AIST Tokyo Waterfront  
Bio-IT Research Building, 11F  
2-4-7 Aomi, Koto-ku,  
Tokyo 135-0064, Japan



Hosting institute: National Institute of Advanced Industrial Science and Technology (AIST) Waterfront 3F  
Digital Human Research Center  
2-3-26, Aomi, Koto-ku, Tokyo 135-0064, Japan



Workshop office: HOMETRICA CONSULTING - Dr. Nicola D'Apuzzo  
Via Collegio 28, CH-6612 Ascona, Switzerland



Workshop website: [www.3dbodyscanning.org/A2012](http://www.3dbodyscanning.org/A2012)

Workshop e-mail: [asia@3dbodyscanning.org](mailto:asia@3dbodyscanning.org)