

120Hz 3dMDbody18.u System (120fps)

120Hz 3dMDbody18.u System (120fps)



## FROM HEALTHCARE TO TRAINING, WEARING, AND POPULATING THE METAVERSE (WEB 3.0)

Science Museum, London  
2000



2000  
SIGGRAPH



LSM – World's largest 3D Avatar farm  
2000-2004 circa 350,000 enrolments



# The New York Times

Putting Your Face Inside a Video Game

By JEFFREY R. YOUNG August 9, 2001

**P**LANO, Tex. --MOST people don't smile or make silly faces when they step into the photo booth in the GameStop software store in this town near Dallas. Instead they try to look as menacing as possible.

The booth, made by 3Q Inc. of Atlanta, creates a three-dimensional digital image rather than a strip of photographs for your scrapbook. The image, burned onto a CD, can be uploaded to popular video games like Quake III Arena or Counter-Strike and projected onto the head of a virtual character. The booth even allows digital warriors to add a grisly scar or shape the neck and face to look more muscular.

"Some people go for a really, really far-out face," said Casey Hogg, the manager at GameStop, one of three retail stores in the country that is testing the machines for 3Q. A common pose is "gnashing teeth, furrowed brow, flared nostrils," he said.

As the graphics in video games and other virtual environments grow more detailed and realistic, 3Q and other companies are developing ways to help people project their three-dimensional images into cyberspace. Proponents of the technology say that Internet users may soon use realistic 3-D representations of themselves, known as avatars, for online activities like trying on clothes in virtual shopping malls or for e-mail in which an image of the sender reads a message aloud to the recipient.

Transporting the computer user into a virtual world has long been a popular science fiction on fantasy. The 1982 Disney film "Tron" centers on a computer programmer who is scanned by a laser that takes him into a computer network. Neal Stephenson's best-selling 1992 novel, "Snow Crash," depicted a three-dimensional universe in cyberspace that computer users



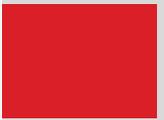
Carlos Lopez-Barillos for The New York Times  
Jan Saiz of Barcelona used the booth at a Cyberathlete Professional League contest in London to add a scar to his face and face to look more muscular.



Carlos Lopez-Barillos for The New York Times  
After adding scars to his face, Jan Saiz of Barcelona loaded his image



Carlos Lopez-Barillos for The New York Times  
TRANSFORMED Chris Lane, chief executive of 3Q, which makes a photo booth that creates a three-dimensional digital image of the user.

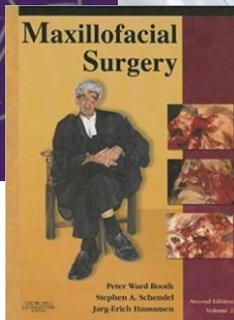


2000-2001. 3dMD Cyberspace Manifesto 1.0

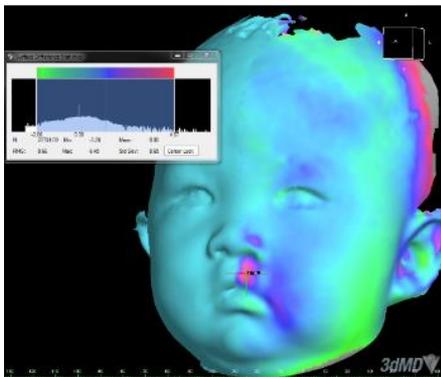
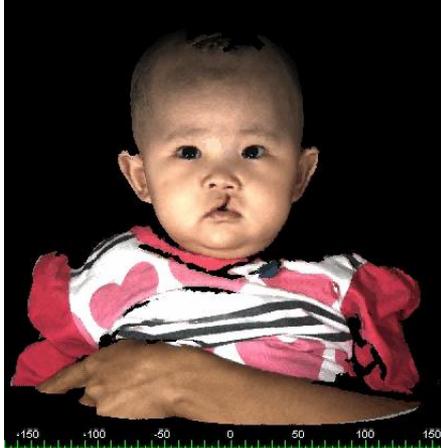




Thank You Peter.  
**Peter Ward Booth**



Thank You Steve.  
**Stephen A Schendel**



The two world-class surgeons who inspired 3dMD to develop a 3D surface imaging technology for use with children with craniofacial anomalies.

**2000.** Clinical Required 'Near Ground Truth' Anatomical-3D Shape Data





'Near Ground Truth' 3dMD image  
+  
'Near Ground Truth' CT/CBCT image  
=  
'Near Ground Truth' 3D Virtual Patient  
for Surgical Planning & Outcomes Assessment

1:1 Superimposition with Other 3D Imaging Modalities. CT | MRI





# COMPUTER-AIDED MAXILLOFACIAL PROSTHETIC TREATMENT OF COMBAT-RELATED CRANIOFACIAL INJURIES



**Joe Villalobos, Col, USAF, DC**  
Maxillofacial Prosthetics, Program Director  
Wilford Hall Medical Center, Lackland AFB, TX



IED Blast Injury



## DATA ACQUISITION



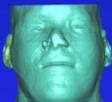
CT Scan



Stereophotogrammetry



## DATA MANIPULATION & OUTPUT



Mirror Imaging Left Ear



Virtual Sculpting



Ear Imported from External Source and Modified



Stereolithography

Three-dimensional imaging, computer-aided design and rapid prototyping are technologies used at WHMC for treatment planning, design, surgical placement of craniofacial implants and fabrication of facial prostheses.

Advantages include:

- 1) accurate replication of anatomical form
- 2) optimal positioning of implants into underlying bone.
- 3) accurate placement of craniofacial implants during surgery
- 4) quicker turn around with fewer visits



Clinical Verification



3D Visualization



Planning Implant Position



Virtual Surgical Guide



Guided Implant Placement



Craniofacial Implants Placed



IED Injury



Auricular Prosthesis

Clinical Innovations that Continue to Motivate 3dMD

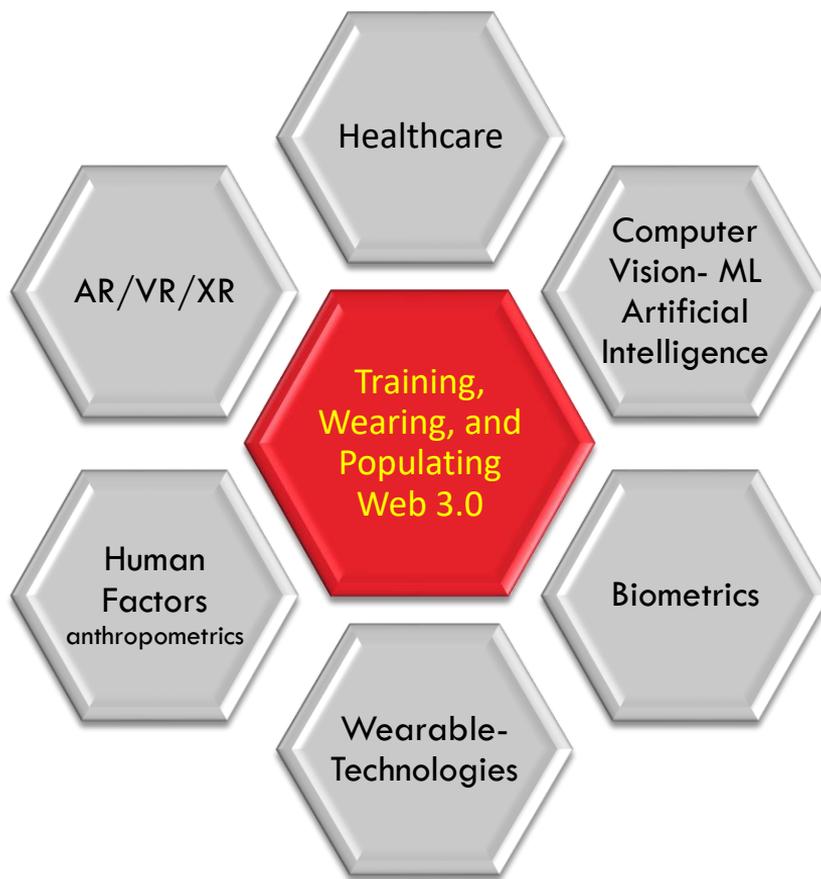




60Hz 3dMDhead5.u System (60fps)

Software-Driven 3dMDhead5.u System in Action





**2014. First temporal (motion 4D) 3dMDbody.u System** installed at Max Planck Institute for Intelligent Systems, Perceiving Systems (to support Michael Black's research initiatives). Today... [60Hz 3dMDbody26.u System](#) | [60Hz 3dMDhead.u System](#) | [60Hz 3dMDhand16.u System](#) | [40Hz 3dMDfoot.u System](#)

**2022. More than 7,500-plus 3dMD cameras worldwide** in thought-leading corporate innovation centers, influential academic institutions, and prominent teaching hospitals.

[Some 3dMD Customer Community Research](#)

2022. Applications of Use by 3dMD Customer Teams.

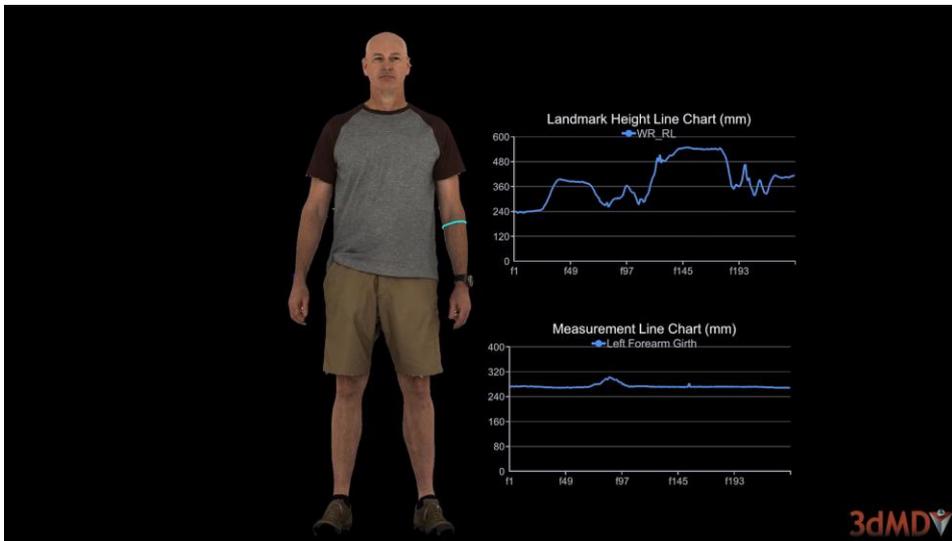


# Training the Metaverse

Training computers about people

Training devices to communicate with people

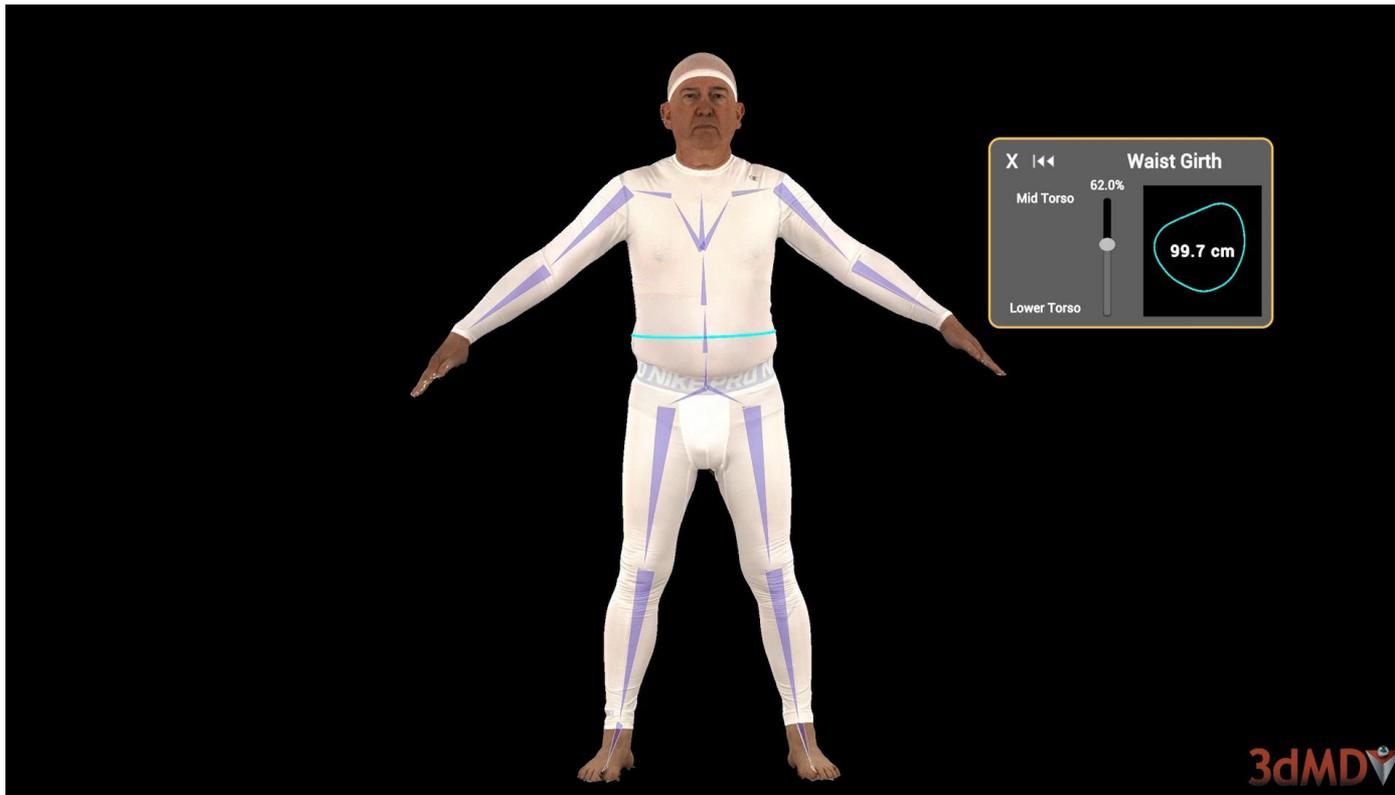




3dMDbody26 System- Special Zone of Interest: Upper torso and face

Training Devices to Recognize Everyday Interactions

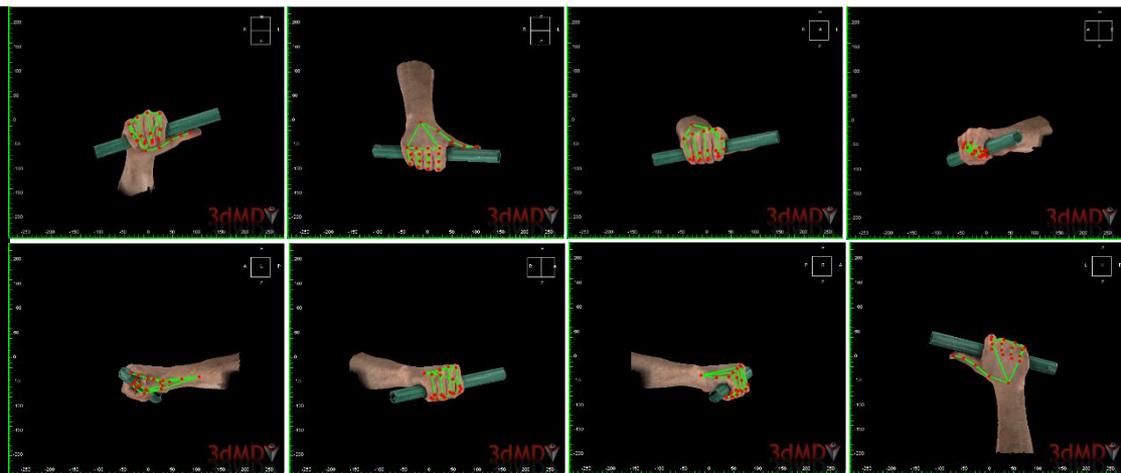
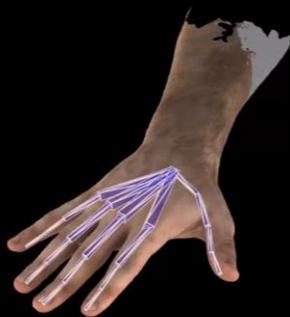




3dMDbody26 System

Quantitate Body Shape Change with Movement





\*Re-applying composite 3D to 2D image and skeleton fitting approach from 3dMD Body Tracking. MediaPipe modified by 3dMD.

1 / 259

3dMDhand7 System

## 2D Composite Skeleton Fitting to 3dMDhand Image Sequence



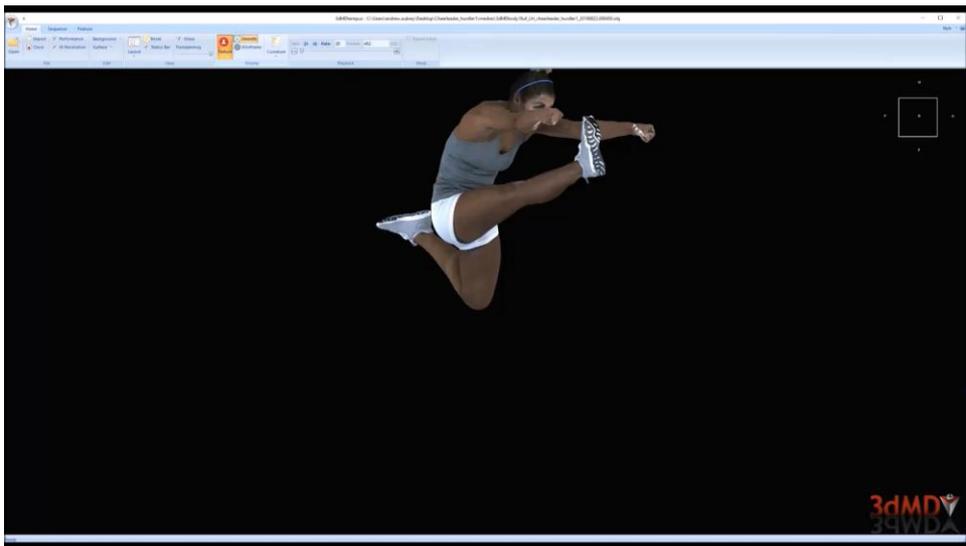
©2022 3dMD. All rights reserved.



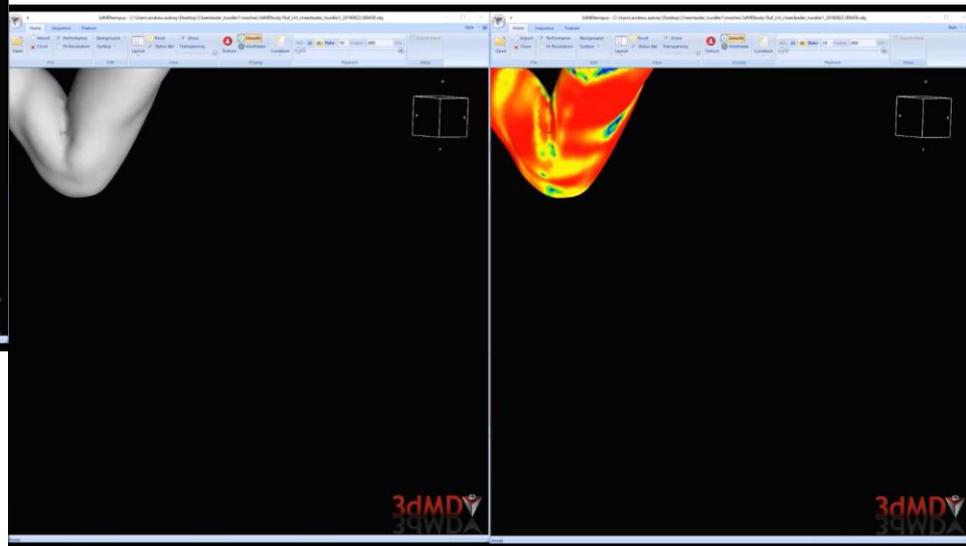
3dMDhand12 and  
3dMDhand16 Systems

Transitioning the MANO Model into the Real World





3dMDbody22 System



‘Near Ground Truth’ Soft Tissue Deformation. 4D Data Training.



# Wearing The Metaverse





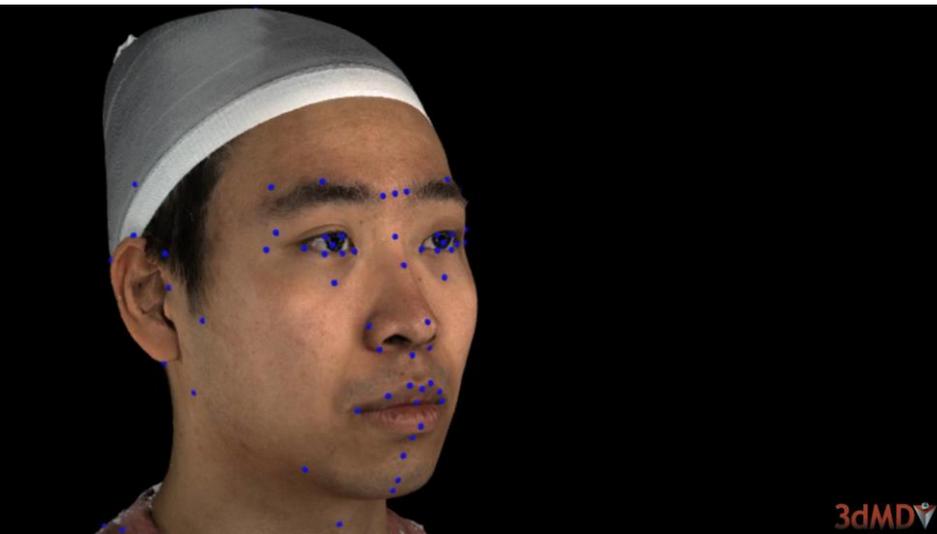
3dMDhead12 System- Special Zone of Interest: Ears

### 'Near Ground Truth' Measurements

Distance: Crevasse	44.82mm
Angle:	48.7 degrees
Distance: Upper Ear to Head	16.83mm
Distance: Lower Ear to Head	10.01 mm

Optimize Hearable Fit and Smart Eyewear/OHMD Stability





3dMDhead9 System- Special Zone of Interest: Eyewear

Evaluate Fit and Comfort of Head Mounted Display Units





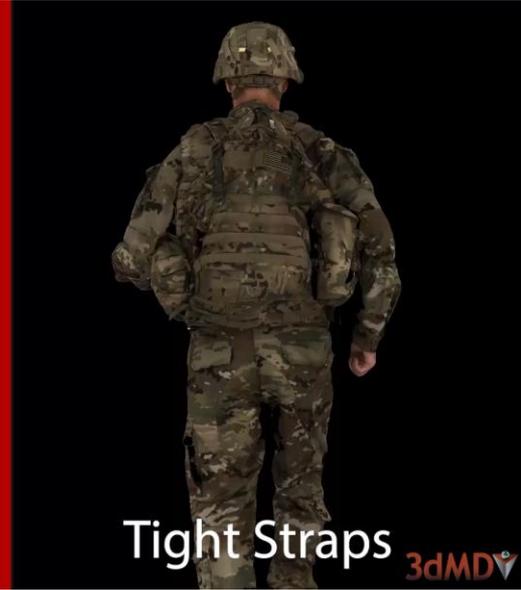
Superimposition of Loose and Tight Chin Strap Images with Mouth Wide Open

Chin Strap	Loose	Tight
Distance: Eye plane to strap	116.90mm	101.93mm
Distance: Upper to lower lip	54.01mm	29.61mm

3dMDbody26 System- Special Zone of Interest: Upper torso and face

Evaluate Fit and Comfort of Head Gear with Wearables





3dMDbody26 System- Special Zone of Interest: Upper torso and face

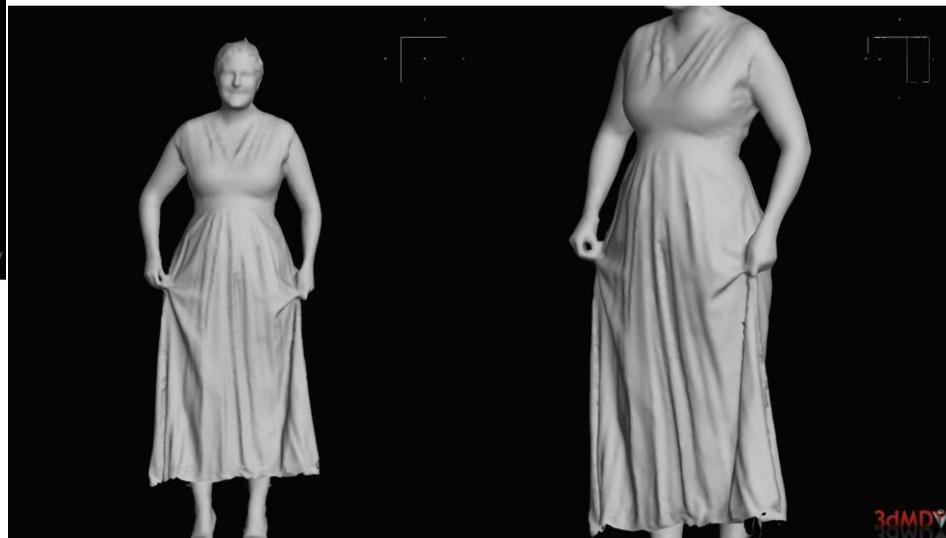
Evaluate Fit and Comfort of Gear with Wearables



©2022 3dMD. All rights reserved.



3dMDbody18 System



'Near Ground Truth' Fabric Motion Capture



# facebook research

DeepWrinkles: Accurate and Realistic Clothing Modeling 13



a) No Normal Map b) Ground-Truth c) Reg. with temporal d) 200 with temporal e) 500 with temporal f) Reg. no temporal

**ECCV 2018**  
European Conference  
on Computer Vision  
8 – 14 September 2018 | Munich, Germany

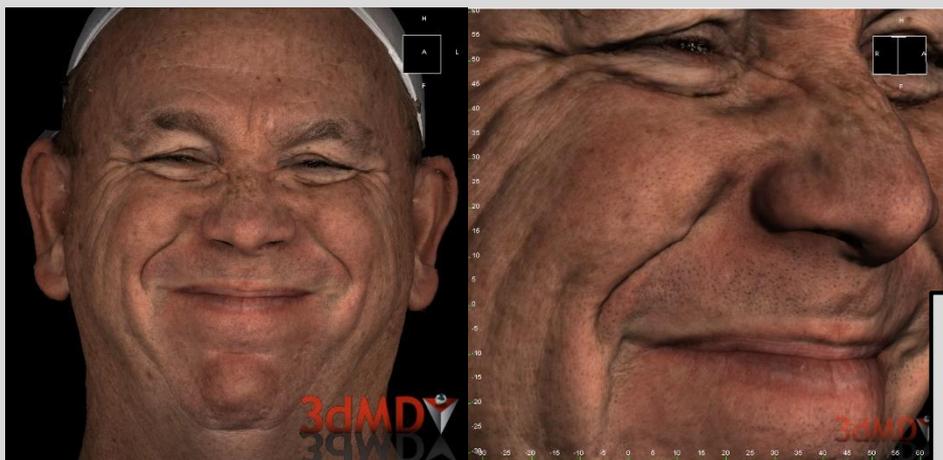


Figure 1: ClothCap enables automatic transfer of 3D clothing to new bodies. Captured subject on the left. Synthetic animation on the right for a new body.



# Populating the Metaverse





Light Effect

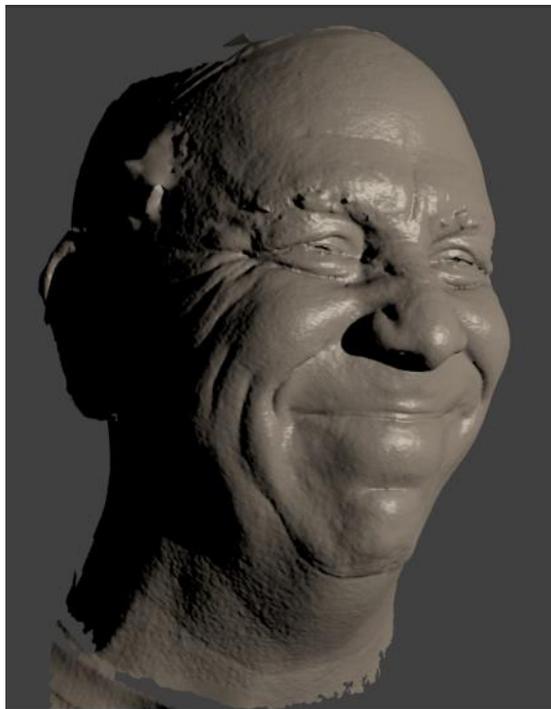
3dMDface.v System



Normal Maps

Source for Generating High Resolution Avatars





3dMDface.v System

Derived from 'Near Ground Truth' Anatomical-3D Shape Data



HOME → SEE AND DO

## LIVE SCIENCE

Live Science is an ongoing project in which scientists carry out research in the museum using visitors as volunteers. Take part and find out more about yourself. Nothing dangerous—just fun, interesting experiments.

Our next project, starting on 24 October 2019, is:

### CAN A 3D SCAN OF YOUR BODY CHANGE THE WORLD?

In this Live Science experiment scientists from Imperial University London and UCL need your help to create a large and diverse collection of 3D body scans of the human body.

Using a cutting edge camera system participants will be scanned and then able to see and manipulate their own digital body in 3D.

The 3D models created with this experiment could be really useful to a wide group of scientists and engineers who need to understand how diverse the human body can be and how we move about. These include fields as varied as medicine, bio-engineering and prosthetics design, and even special effects in movies and video game design.

This research project is suitable for those 8+ and parental consent will be required for those below 15 years.

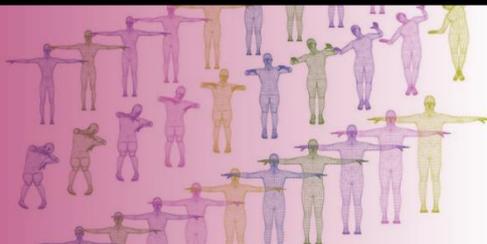
#### FREE EVENT

**DATE:** Thursday 24 October – Friday 31 January 2020

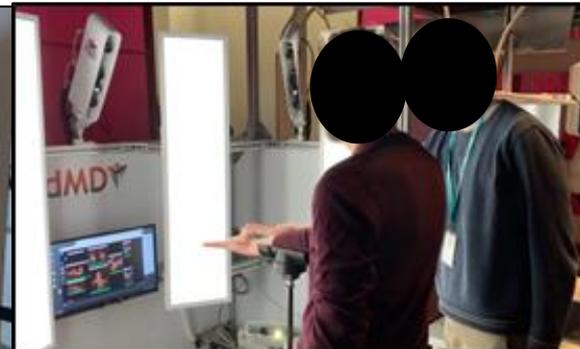
**TIME:** Wednesdays, Thursdays, Fridays, Saturdays and Sunday 11.00-16.30 (except Wednesday 25 and Thursday 26 December)

**LOCATION:** Who Am I?, Level 1

**AGE:** 8+



3dMbody14.r System



3dMDhand System

Achieved: 4,600 Body Recruits in Street Clothing

Oct 2019-Jan 2020. Science Museum, London



Imperial College  
London





3dMDbody26 System- Special Zone of Interest: Upper torso and face

## Subtle Gestures Associated with Speech

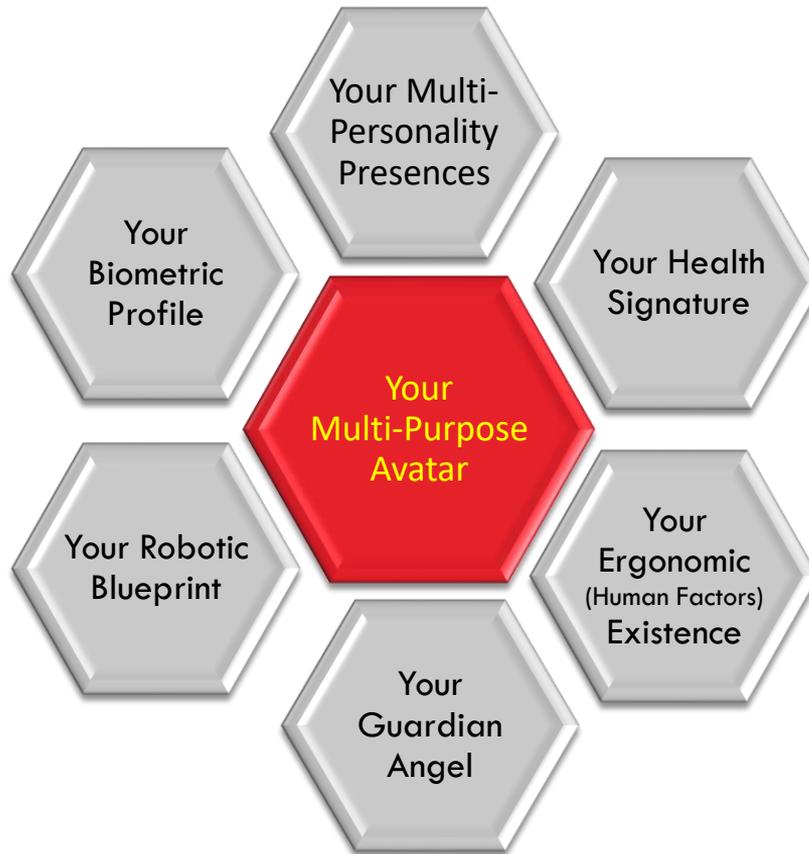




60Hz 3dMDbody22.u System

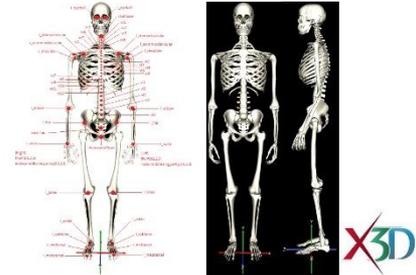
Total Body Expression





H-Anim skeleton available

<http://www.web3d.org/x3d-resources/content/examples/Basic/Medical>



Web 3.0 | Metaverse: Secure Subject Enrolment (3.5Bn People)



©2022 3dMD. All rights reserved.

# Web 2.0=Chaos of Personal Privacy. Web 3.0/Metaverse will fail if we repeat this.

- Lifetime, Encrypted Data Container. Generated on enrolment.
- NFT- 'type' licencing
- Emergent 3D standards that 3dMD is working with...

**KHRONOS**  
GROUP

**gITF**

**3MF**  
CONSORTIUM

**HL7**  
International

**DICOM**  
*Digital Imaging and Communications in Medicine*

**web|3D**  
CONSORTIUM

**X3D**  
VERSION 4

**H-Anim**  
HUMANOID ANIMATION

**IEEE**  
*Advancing Technology  
for Humanity*

**Metaverse**  
STANDARDS FORUM™

**3dMD**



SMPL

Your Multi-  
Personality  
Presences

Your  
Biometric  
Profile

Your Health  
Signature



X3D

Avatar

Your  
Ergonomic  
(Human Factors)  
Existence



Your Robotic  
Blueprint

Your  
Guardian  
Angel

An Avatar Centric Data Management Approach





Booth 925



For more information, please...

Visit 3dMD. [www.3dmd.com](http://www.3dmd.com)

Find 3dMD. [www.linkedin.com/company/3dmd](https://www.linkedin.com/company/3dmd)

Like 3dMD. [www.facebook.com/3dMDcommunity](https://www.facebook.com/3dMDcommunity)

Follow 3dMD. [www.twitter.com/3dMD](https://www.twitter.com/3dMD)



Thank you for your time. Have a great conference.

