

High-End Virtual Humans at a lower cost

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HUMAN-ENGINE

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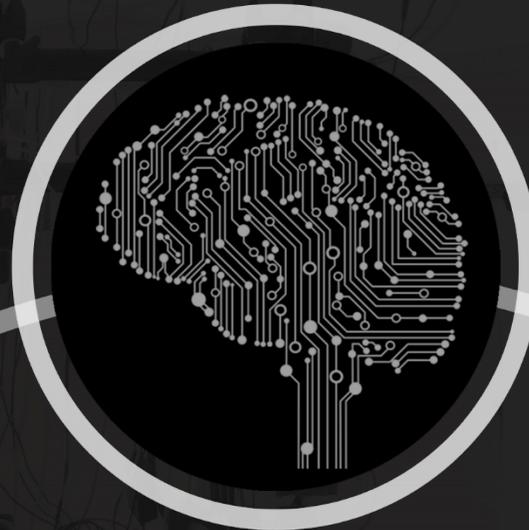
About Us

Headquartered in Los Angeles, California, Human Engine uses high-end hardware (3D/4D Scanning), photogrammetry and machine learning to deliver scan-based game-ready 3D characters for interactive media such as games, mobile apps, VR and AR, at a lower cost.

Goal: Use NVIDIA AI to automate processing of scans



**3D / 4D Scanning
Photogrammetry**

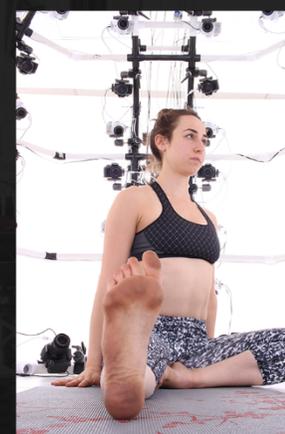


**Deep Learning
cuDNN**



**Game-Ready Characters /
Compressed 4D**

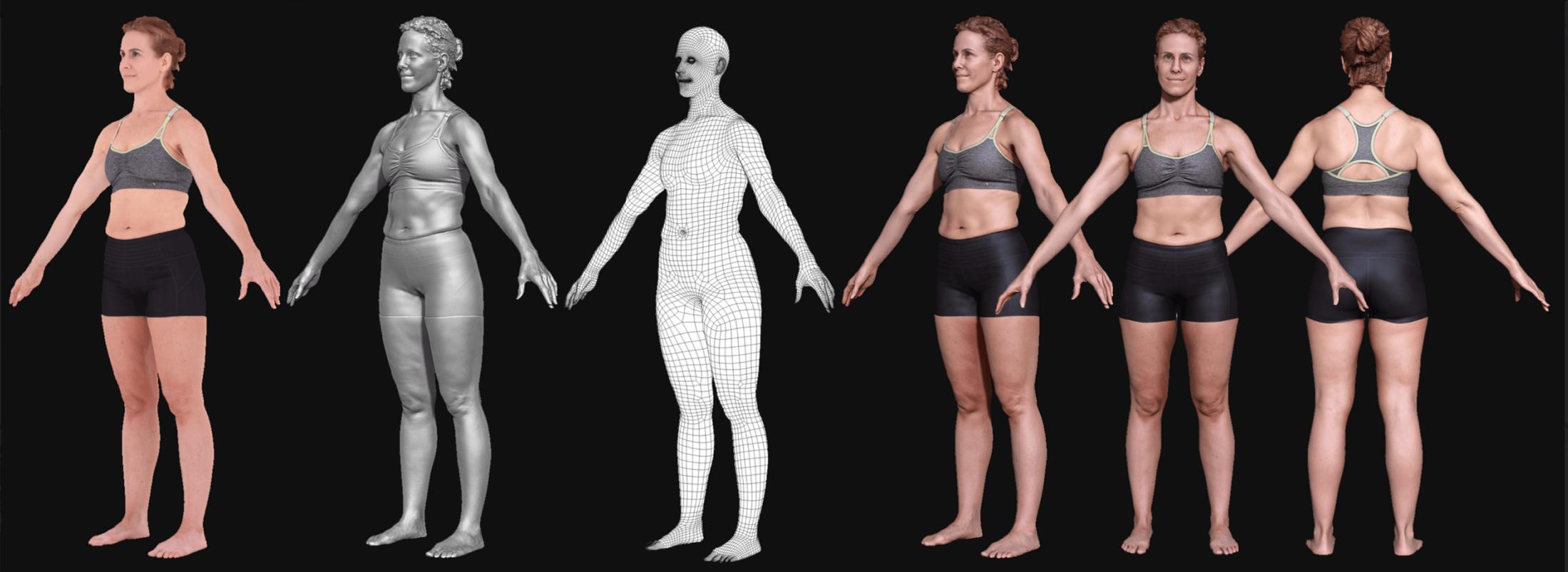
3D / 4D scanning has generated large volume of data: can be used to train DNN



Adjustable 180 DSLR camera-rig designed for R&D and high end 3D/4D scanning.

Automation of A-Pose scan processing

➤ Body Scan



PHOTOSCAN

CLEANED 3D SCAN

RETOPOLOGY

3D RENDER

Standard A-Pose process: 3D scan – Process scan data – Automate Mesh Reconstruction – Mesh Clean Up – Retopology – Maps Generation – Rendering

Rigged and Game-Ready Characters

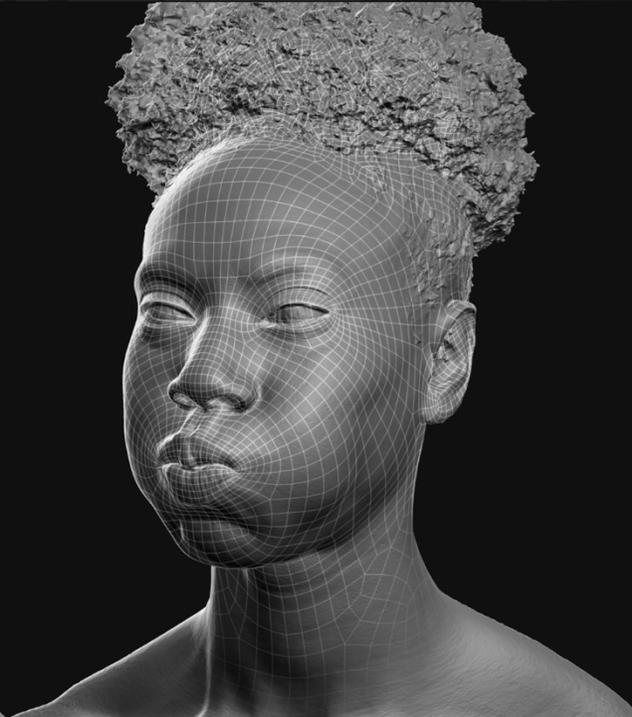
➤ Head Scan



PHOTOSCAN



CLEANED 3D SCAN



RETOPOLOGY



3D RENDER

AI used to automate the creation of facial blend-shapes from expression scans

Rigged and Game-Ready Characters

➤ Body Scan



Re-topologize non-standard poses with AI automation

Clothing Scans : How to automate the creation of 3D clothing from scan data?

➤ Full Body Scan



We use NVIDIA PhysX Apex Clothing to create characters with dynamic clothing from scan data.

Clothing Scans

➤ Full Body Scan



Our scanning system has a larger volume and is customizable to match different types of projects

Clothing Scans

➤ Shoe Scan



Different types of camera lenses are used for scanning smaller objects such as shoes, bags, props, food, etc.

Animated Scans

➤ Head Scan



We scan facial expressions which we use to make facial rigs that can be used with motion capture or other traditional animation techniques.

Animated Scans – Smart Skin™

➤ Body Scan



Low frequency scans for muscle deformation (from 1 to 16 frames per second)

4D Capture

➤ Head Scan

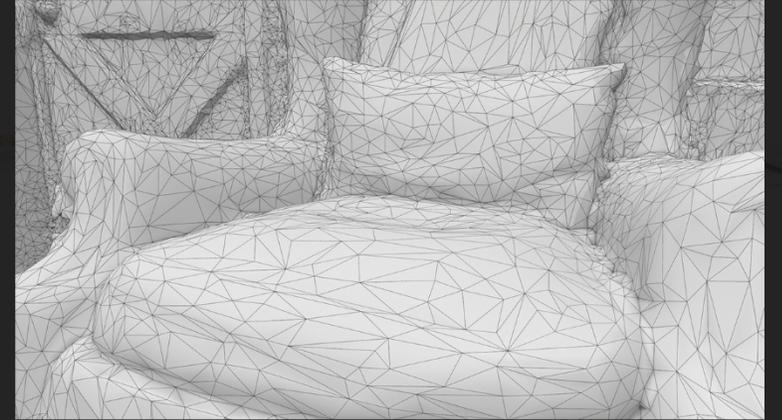
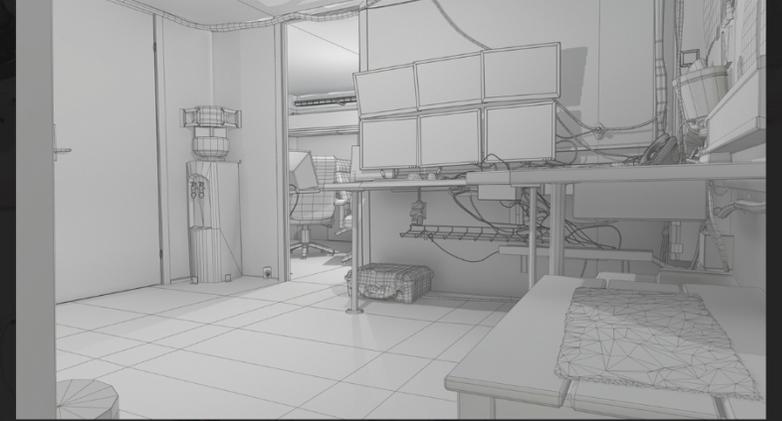
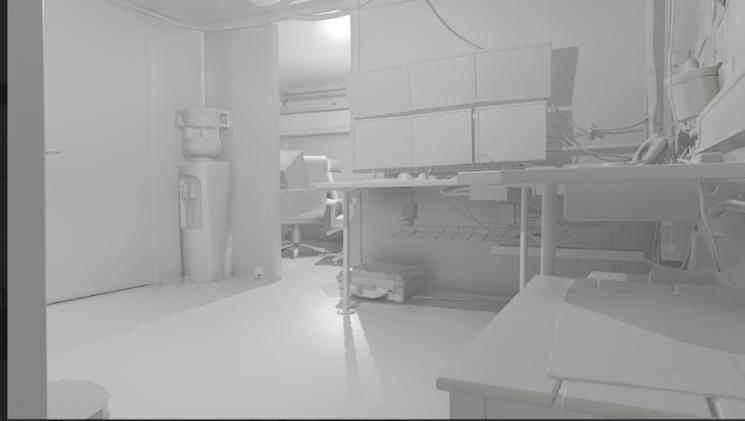


Using synchronized and high-performance video cameras, we acquire realistic and accurate facial and body movements at high frame rates (up to 60 FPS)



VOLUMETRIC 4D
SMARTSKIN™
AI-DRIVEN 4D COMPRESSION

Other scan data that can benefit from AI



Mesh Simplification and Texture Clean-up

Environment Scan: How to use AI to automate processing of environmental scans?



Simplification / Stylization of indoor environments

Virtual Reality: Use VR player data to train DNNs



Using Deep Learning, we generate natural movement of digital characters in VR and develop the player's movement.

Low-cost volumetric: use AI to automate noise removal from mesh and texture



Portable, low-cost Volumetric Capture using synchronized Intel RealSense D415 Cameras.

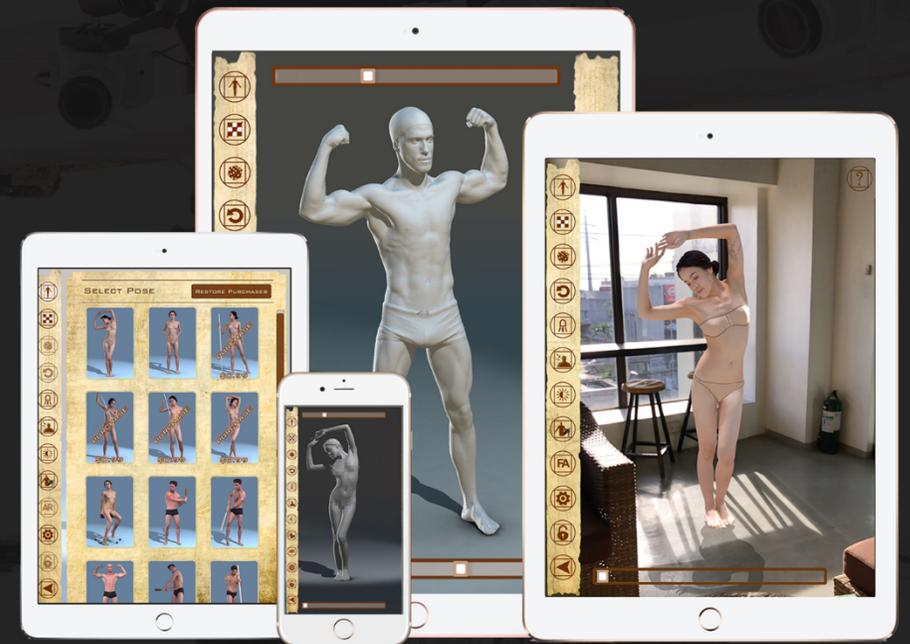
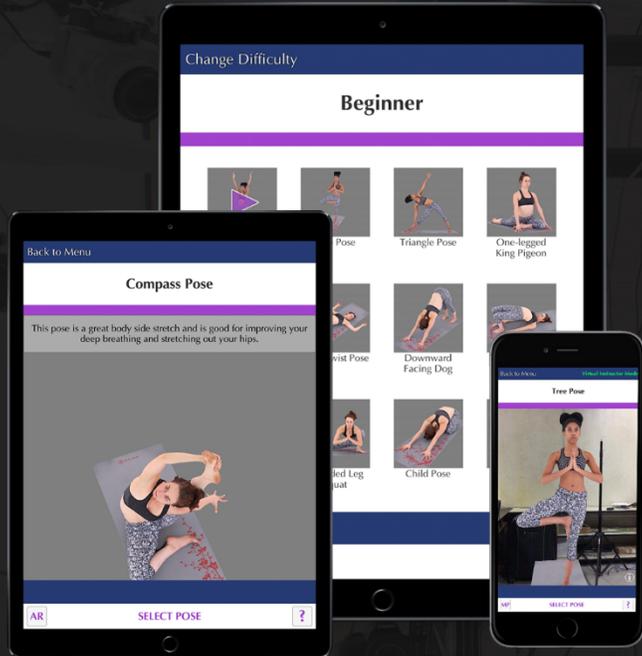


Untextured Mesh



Textured Mesh

Augmented Reality



Minute Pose – 3D Yoga with Augmented Reality
(www.minutepose.com)

Figure Anatomy for Artists
(www.figureanatomy.com)

Machine Learning Frameworks and Deep Learning SDKs



Tensorflow



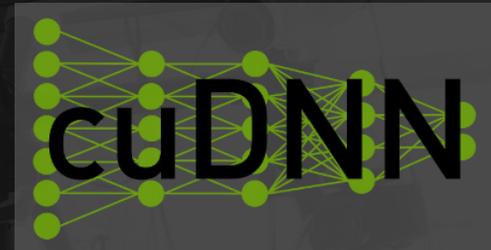
OpenCV

Caffe

Caffe – deep learning framework

theano

Theano



NVIDIA CUDA® Deep Neural Network Library



OpenPose

We specialize in different machine learning platforms such as above.

Speech-Driven Character Animation: use 4D data to train NVIDIA cuDNN for lip-sync



We're working on innovating and redefining traditional asset creation with AI

Selected Partners and Clients



RYOT



GAP



VAYLIAN

SONY



SPEECH GRAPHICS



Hurley

Google



KOHL'S

PET GORILLA

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