

# Simi Shape<sup>3D</sup>

## Revolutionary Markerless Motion Capture

- No markers used
- 3D full body Motion Capture
- 8 high speed color cameras
- Silhouette tracking

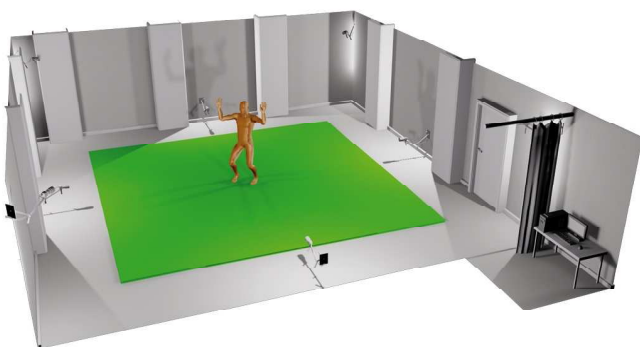
Simi always counted on the strength of image based motion capture, as we believe that visual information delivers much more than infrared filtering, not only for perception of analysts and subjects, but also for computing data!

Simi has now taken the next step in Motion Capture technology by enhancing their Simi Motion system to include new revolutionary methods of markerless Motion Capture. Based on silhouette information the new algorithms provide 3D full body motion capture without using anatomical landmarks. Investing in a new Simi Motion System will give you access to traditional Motion Capture techniques like marker tracking but also revolutionary marker free Motion Capture.



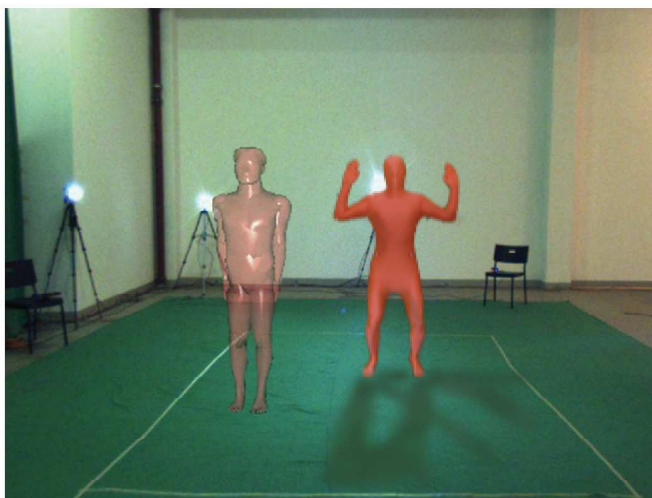
**Simi Shape<sup>3D</sup> provides automatic markerless human Motion Capture.**

The new technology developed by Simi and leading German technology institutes allows image-based Motion Capture, without the need to attach markers or any other devices to the actor. The actor can move freely in the calibrated room whilst being recorded by up to 8 synchronized high-speed color cameras.

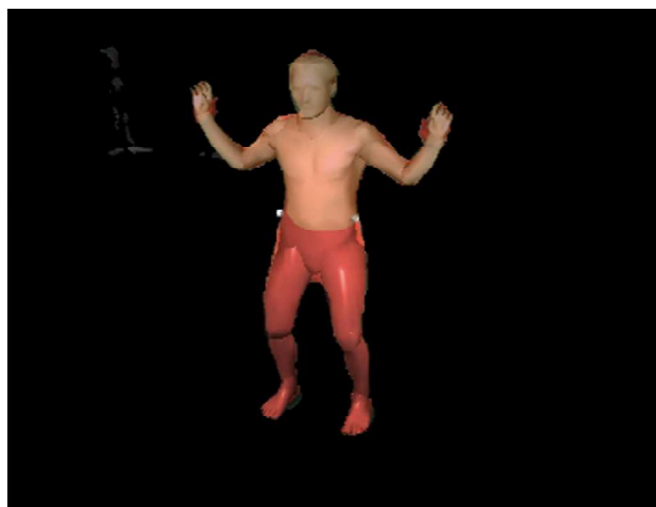


**Simi Shape<sup>3D</sup> computes pose and position of the actor from high-speed color videos.**

The first step extracts the silhouette of the actor from each image. A virtual 3D-model is then fitted to the silhouette of the actor in each camera perspective. Simi Shape3D automatically fits the virtual model to the actor starting from the initial pose in the first frame. Segment lengths and widths of the model are adjusted to the actor. The subsequent tracking delivers motion capture data (translations and rotations) for the complete sequence. Joint positions and rotations are extracted from the pose and position of the model.



*Actor in initial pose and model*

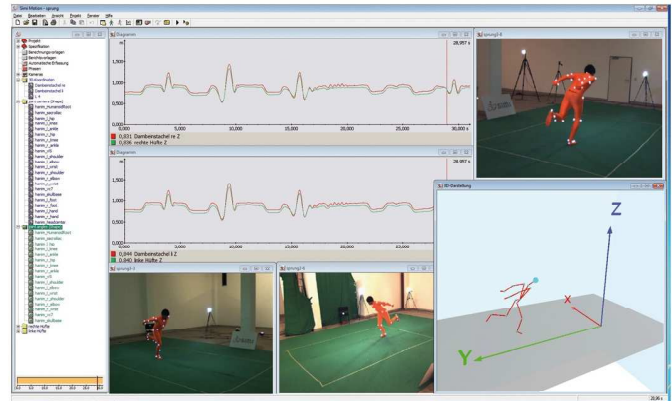


*Segmented image of the actor and the adjusted model*

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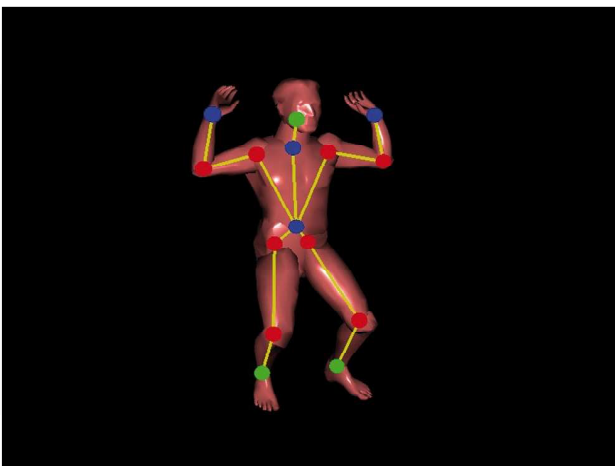
Simi Shape<sup>3D</sup>, as part of Simi Motion, provides the complete package of capturing, processing and reporting data. Data are recorded using the Simi Motion system, which includes 8 synchronized high speed cameras and external equipment can be integrated to provide additional data for analysis (EMG, force plates, etc.). The cameras are calibrated in Simi Motion utilising new lens distortion correction for high accuracy. The actor's movements are tracked automatically and 3D Motion Capture data for the sequence are generated. Additional optional markers can also be placed at the pelvis to increase accuracy. Joint position and joint angle data can be used in Simi Motion for further processing or exported to other software packages (see Simi Motion descriptions).



Data processing with SIMI Motion



The silhouette of the actor is tracked



The model has 16 joints and 41 degrees of freedom

Simi Shape<sup>3D</sup> uses a virtual human model consisting of joints, segments and 3D-surface.

Altogether, there are 41 degrees of freedom for full body motion capture and 20 degrees of freedom for the lower extremities.

Simi Shape<sup>3D</sup> can be applied in areas such as entertainment, biomechanical research, medical evaluations, sport science, ergonomics and more.

### Simi Shape<sup>3D</sup>

- Automatic scaling of virtual model to actor
- Automatic detection of pose and position for complete sequence
- 3D joint positions and angles
- Possibility for pose correction by user
- Processing results in Simi Motion
- Add pelvis markers for higher accuracy

Please contact our experts for individual consulting or further questions.

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