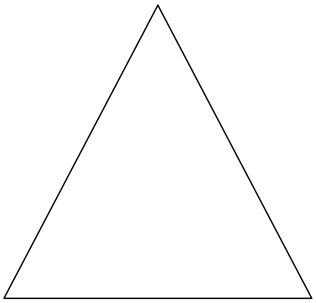
Human Degrees of Freedom

Motion Sources

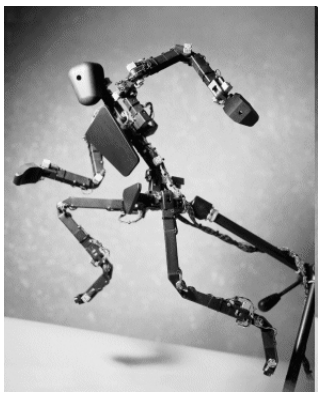


Motion Capture Technologies

1. mechanical
2. fibre optic bending
3. electromagnetic
4. inertial and gyros
5. active optical
6. passive optical
7. depth camera
8. multicamera vision
9. single camera vision

(1) Mechanical

Gypsy



Monkey 2

inition.co.uk

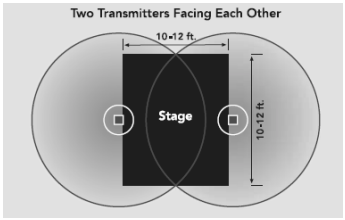
(2) Fibre optic bending

measurand.com
(New Brunswick)

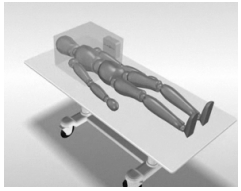
vrlogic.com

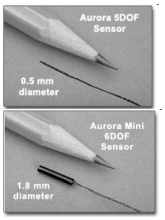
(3) Electromagnetic

vrlab.epfl.ch



ascension-tech.com





ndigital.com
(Waterloo)

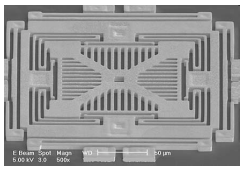
(4) Inertial and Gyros

Inertial Measurement Unit (IMU)
3 accelerometers + 3 axis gyro

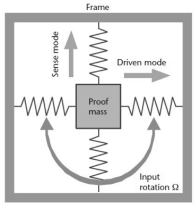
Gypsy Gyro 18
inition.co.uk

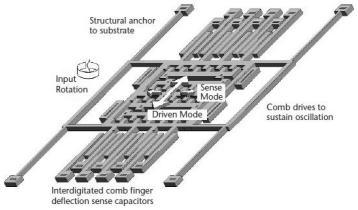
Xsens MVN
xsens.com

Wii, Wii Motion Plus



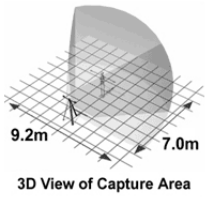
3-axis accelerometer
sensorsmag.com





solid state gyro
knol.google.com

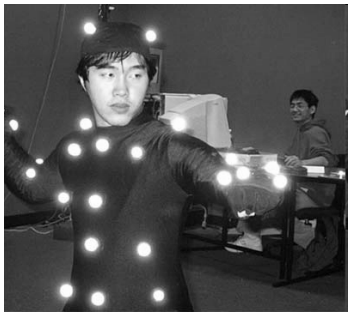
(5) Active Optical



Visualeyez
ptiphoenix.com
(Burnaby)

ndigital.com
(Waterloo)

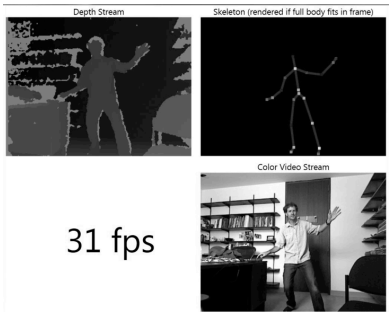
(6) Passive Optical



Vicon, Motion Analysis, Northern Digital

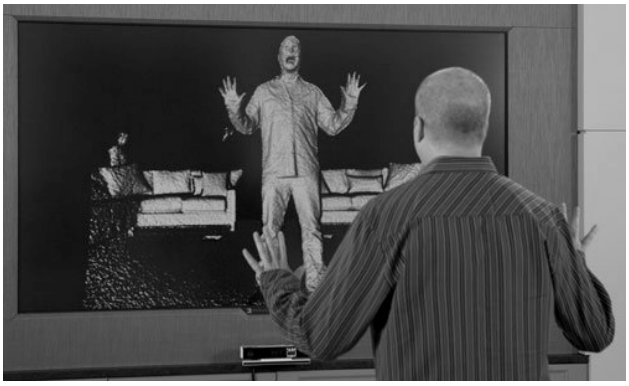
(7) Depth cameras: Kinect, others

John MacCormick slides



"To keep the training times down we employ a distributed implementation. Training 3 trees to depth 20 from 1 million images takes about a day on a 1000 core cluster."

Kinect 2 (Xbox One)



(8) Multicamera vision

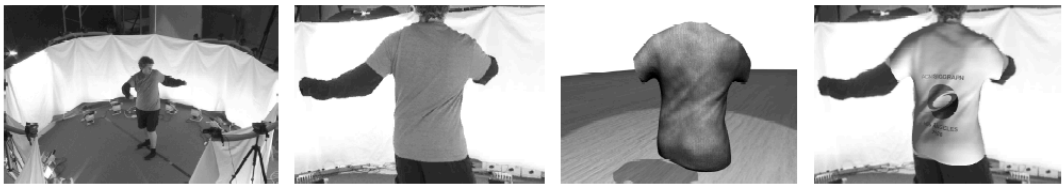
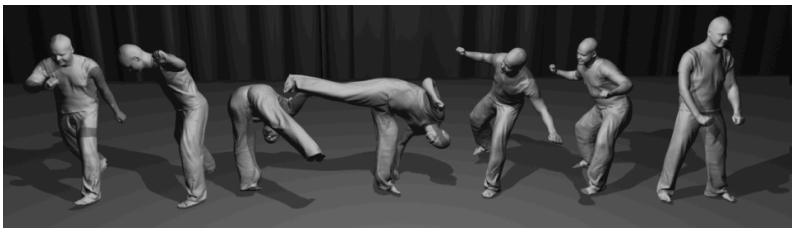


Figure 1: *Left to right: an actor performing in the capture setup; one of sixteen views from the camera array; reconstructed T-shirt geometry; the real T-shirt is replaced by a rendering of the captured geometry with different appearance characteristics.*

SIGGRAPH 2008



SIGGRAPH 2008

(9) Single Camera Vision