Motion Capture

Is the process of recording movement of objects, animals, or a person.

It has been used in military, entertainment, sports, medicine, and in robotics
Motion Capture

Specifically in filmmaking and games it refers to recording the actions of human actors. Then using that data to animate 3d character models.
Motion Capture

When it includes face and fingers in order to capture subtle expressions it is called PERFORMANCE CAPTURE.
Motion Capture

Motion Capture captures an actor's movements, not his or her appearance.
Motion Capture

This data is referred to as “animation data” and is then mapped onto a 3D model so that the model performs the same action as the actor.
Motion Capture

In motion capture sessions, movements are sampled many times per second. Early techniques used images from multiple cameras to calculate 3D positions.
Motion Capture

Rapid results are possible. It reduces the need for keyframe based animation. This reduces cost and speeds up production.
Motion Capture

It allows for more performances to be done with different styles of acting.

This is difficult in keyframe animation.
Motion Capture

An actor's talent can come through into the animation.
Motion Capture

Complex movement and realistic physical interactions such as secondary movements, weight, physics, and exchange of forces can be easily recreated in a physically accurate manner.
Motion Capture

The amount of animation data that can be produced within a given time is large compared to traditional animation techniques.
Motion Capture

Specific hardware and special software programs are required to obtain and process the data.
Motion Capture

Often the capture system can have specific requirements for the space it is operated in, such and camera field of view or magnetic distortion.
Motion Capture

When problems occur it is easier to reshoot the scene rather than trying to manipulate the data.

Newer systems allow for real-time viewing of the data for fast directorial decisions.
Motion Capture

Traditional animation techniques such as added emphasis on anticipation and follow through, secondary motion or squash and stretch must be added later.
Motion Capture

Care must be taken when working with characters of different proportions than an average human to avoid geometry intersecting
Motion Capture

Mo Cap is used extensively in video games since as early as 1995. Highlander: The Last of the MacLeods
Motion Capture

Gollum
Motion Capture
The Mummy
Motion Capture

King Kong
Motion Capture

Davey Jones
Motion Capture

Na’vi in Avatar.
Motion Capture

Clu from Tron was CG mo cap.
Motion Capture

Rise of the Planet of the Apes
Final Fantasy: The Spirits Within was one of the first widely released movies that used motion capture.
Motion Capture

Polar Express, Hanks
Motion Capture

Beowulf 2007
Motion Capture
Happy Feet
Motion Capture

During the filming of Avatar all of the scenes involving this process were directed in real-time using Autodesk MotionBuilder software to render a screen image which allowed the director and the actor to see what they would look like in the movie.
Motion Capture

Optical Systems utilize data captured from image sensors to triangulate the 3D position of a subject between one or more cameras calibrated to provide overlapping projections.
Motion Capture

Optical Systems

There are special markers attached to the actor.
Motion Capture

Passive Markers

Passive optical systems use markers coated with a retroreflective material to reflect light that is generated near the cameras lens.
Motion Capture

Active Marker

Active optical systems triangulate positions by illuminating one LED at a time very quickly or multiple LEDs with software to identify them by their relative positions.

Rather than reflecting light back that is generated externally, the markers themselves are powered to emit their own light.
Motion Capture

Inertial Systems
This system is based on miniature inertial sensors that transmit wirelessly to computer, where the motion is recorded or viewed. There are no cameras needed for this system.
Motion Capture

This system uses a large skeleton like structure that the actor connects to his or her body. A series of light weight metal or plastic rods allows for real-time, are free of occlusion, and are wireless. However the suites tend to be very expensive.
Motion Capture

Magnetic Systems

Magnetic systems calculate position and orientation by the relative magnetic flux of three orthogonal coils on both the transmitter and each receiver. These can be susceptible to magnetic and electrical interference.