

# Various types of MoCap, a comparison

**MoCap**, short for **motion capture**, is a technique used to digitally record movement. In art, it's a tool that allows creators to translate physical gestures into digital data that can be used to generate or manipulate digital work.

## What is MoCap?

Motion capture often involves placing **sensors or markers** on a person's body (or using camera-based systems) to track movement in 3D space. This data is then sent to software that interprets the motion and applies it to a **digital avatar, 3D model, or visual system**.

Examples of use:

- **Live performance & dance:** people wearing mocap suits can control visuals, sound or avatars in real time, turning their movement into an interactive experience.
- **Digital puppetry:** Use MoCap to animate virtual characters that mirror their movements, creating storytelling pieces or interactive experiences.
- **Film & animation:** MoCap can be used to create detailed, lifelike animation without manual keyframing.
- **Interactive installations:** Viewers' movements can be captured and visualized, making them part of the artwork.
- **Experimental art & research:** MoCap enables artists to explore themes like embodiment, identity, or data aesthetics by abstracting or transforming movement.

Why artists use it

- **Expressiveness:** It captures the nuance of real human motion.
- **Efficiency:** Complex animations can be recorded rather than animated by hand.
- **Interactivity:** MoCap allows for responsive, **real-time** work—art that moves because you move.
- **Hybrid creation:** It bridges physical and digital realms, letting artists craft performances or immersive visuals that live in both.

There are various types of Mocap:

|                               |                                |
|-------------------------------|--------------------------------|
| <b>Optical Motion Capture</b> | <b>Inertial Motion Capture</b> |
|-------------------------------|--------------------------------|

**How it works:**

- Uses cameras (usually infrared) to track reflective markers or colored dots placed on the performer.
- Multiple cameras triangulate the position of each marker in 3D space.

**Variants:**

- Passive optical (uses reflective markers + infrared light, e.g., Vicon or OptiTrack)
- Active optical (uses LED markers that emit their own light)

**Pros:**

- Very accurate spatial tracking
- Excellent for large-scale and high-precision capture (e.g., dance, film, games)
- Good for multiple actors and full-body motion

**Cons:**

- Requires a studio setup with multiple calibrated cameras
- Sensitive to occlusion (when a marker is hidden from view)
- Expensive

**How it works:**

- Uses IMUs (Inertial Measurement Units), which are small sensors containing gyroscopes and accelerometers.
- Sensors are worn in a suit (e.g., Rokoko, Xsens) and measure rotation and acceleration to calculate joint angles and movement.

**Variants:**

- Can be combined with Optical Mocap for precision.

**Pros:**

- Portable: Can be used anywhere, indoors or outdoors
- Not affected by lighting or line-of-sight
- Great for live performance, field work, and small studios

**Cons:**

- Less accurate in tracking absolute position (especially in large spaces)
- Susceptible to drift over time (though software can correct this)
- Locomotion is harder to grasp, like jumping, climbing etc.
- Rokoko: frustrating glitches & subscription needed for realtime.

Some systems **combine optical + inertial** tracking (e.g., combining Xsens suit with camera tracking or facial capture or Rokoko, iPhone & Coil ), giving the best of both worlds—especially for virtual production and advanced installations.

Revision #3

Created 2025-06-10 10:45:59 UTC by Astrid

Updated 2025-06-10 12:25:14 UTC by Astrid