INTRODUCERE

**Motion capture** (sometimes referred as **mo-cap** or **mocap**, for short) is the process of recording the [movement](https://en.wikipedia.org/wiki/Motion_(physics)" \o "Motion (physics)) of objects or people. It is used in [military](https://en.wikipedia.org/wiki/Military_science" \o "Military science), [entertainment](https://en.wikipedia.org/wiki/Entertainment" \o "Entertainment), [sports](https://en.wikipedia.org/wiki/Sports" \o "Sports), medical applications, and for validation of computer vision[[3]](https://en.wikipedia.org/wiki/Motion_capture" \l "cite_note-3) and robotics.[[4]](https://en.wikipedia.org/wiki/Motion_capture" \l "cite_note-4) In [filmmaking](https://en.wikipedia.org/wiki/Filmmaking" \o "Filmmaking) and [video game development](https://en.wikipedia.org/wiki/Video_game_development" \o "Video game development), it refers to recording actions of [human actors](https://en.wikipedia.org/wiki/Motion_capture_acting" \o "Motion capture acting), and using that information to animate [digital character](https://en.wikipedia.org/wiki/Digital_character" \o "Digital character) models in 2D or 3D [computer animation](https://en.wikipedia.org/wiki/Computer_animation" \o "Computer animation).[[5]](https://en.wikipedia.org/wiki/Motion_capture" \l "cite_note-5)[[6]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-twsBackstage-6)[[7]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-twsGuardian-7) When it includes face and fingers or captures subtle expressions, it is often referred to as **performance capture**.[[8]](https://en.wikipedia.org/wiki/Motion_capture" \l "cite_note-twsWired-8) In many fields, motion capture is sometimes called **motion tracking**, but in filmmaking and games, motion tracking usually refers more to **[match moving](https://en.wikipedia.org/wiki/Match_moving" \o "Match moving)**.

SLIDE 2 - IMAGINI

Cele doua imagini:

* Two repetitions of a walking sequence of an individual recorded using a motion-capture system
* Motion capture of two [pianists](https://en.wikipedia.org/wiki/Pianist)' right hands playing the same piece (slow motion)

AVANTAJE

Motion capture offers several advantages over traditional [computer animation](https://en.wikipedia.org/wiki/Computer_animation) of a 3D model:

* Low latency, close to real time, results can be obtained. In entertainment applications this can reduce the costs of keyframe-based [animation](https://en.wikipedia.org/wiki/Animation).[[10]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-Xsens_MVN_Animate_-_Products-10) The [Hand Over](https://en.wikipedia.org/wiki/Hand_Over) technique is an example of this.

A **Hand-Over** is a term used in the [animation](https://en.wikipedia.org/wiki/Animation) industry to refer to the process of adding finger and hand [motion capture](https://en.wikipedia.org/wiki/Motion_capture) data to the pre-existing full-body motion capture data, using a hand motion capture device.

* The amount of work does not vary with the complexity or length of the performance to the same degree as when using traditional techniques. This allows many tests to be done with different styles or deliveries, giving a different personality only limited by the talent of the actor.
* Complex movement and realistic physical interactions such as secondary motions, weight and exchange of forces can be easily recreated in a physically accurate manner.[[11]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-11)
* The amount of animation data that can be produced within a given time is extremely large when compared to traditional animation techniques. This contributes to both cost effectiveness and meeting production deadlines.[[12]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-12)
* Potential for free software and third party solutions reducing its costs.

DEZAVANTAJE

* Specific hardware and special software programs are required to obtain and process the data.
* The cost of the software, equipment and personnel required can be prohibitive for small productions.
* The capture system may have specific requirements for the space it is operated in, depending on camera field of view or magnetic distortion.
* When problems occur, it is easier to shoot the scene again rather than trying to manipulate the data. Only a few systems allow real time viewing of the data to decide if the take needs to be redone.
* The initial results are limited to what can be performed within the capture volume without extra editing of the data.
* Movement that does not follow the laws of physics cannot be captured.

Traditional animation techniques, such as added emphasis on anticipation and follow through, secondary motion or manipulating the shape of the character, as with [squash and stretch](https://en.wikipedia.org/wiki/Squash_and_stretch) animation techniques, must be added later. **Squash and stretch** is the phrase used to describe "by far the most important"[[1]](https://en.wikipedia.org/wiki/Squash_and_stretch#cite_note-The_Illusion_of_Life-1):47 of the [12 basic principles of animation](https://en.wikipedia.org/wiki/12_basic_principles_of_animation), described in the book [*The Illusion of Life*](https://en.wikipedia.org/wiki/The_Illusion_of_Life) by [Frank Thomas](https://en.wikipedia.org/wiki/Frank_Thomas_(animator)) and [Ollie Johnston](https://en.wikipedia.org/wiki/Ollie_Johnston).

The principle is based on observation that only [stiff](https://en.wikipedia.org/wiki/Stiffness) objects remain inert during motion,[[1]](https://en.wikipedia.org/wiki/Squash_and_stretch#cite_note-The_Illusion_of_Life-1):47 while objects that are not stiff, although retaining overall volume, tend to change shape in an extent that depends on [inertia](https://en.wikipedia.org/wiki/Inertia) and [elasticity](https://en.wikipedia.org/wiki/Elasticity_(physics)) of the different parts of the moving object. To illustrate the principle, a half-filled flour sack dropped on the floor, or stretched out by its corners, was shown to be retaining its overall volume as determined by the object's [Poisson's ratio](https://en.wikipedia.org/wiki/Poisson%27s_ratio).

* If the computer model has different proportions from the capture subject, artifacts may occur. For example, if a cartoon character has large, oversized hands, these may intersect the character's body if the human performer is not careful with their physical motion.

TIPURI DE TEHNOLOGII

# TODO

APLICATII

[Video games](https://en.wikipedia.org/wiki/Video_game) often use motion capture to animate athletes, martial artists, and other in-game characters.[[13]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-13)[[14]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-GPro82-14) This has been done since the [Sega Model 2](https://en.wikipedia.org/wiki/Sega_Model_2) [arcade game](https://en.wikipedia.org/wiki/Arcade_game) [*Virtua Fighter 2*](https://en.wikipedia.org/wiki/Virtua_Fighter_2) in [1994](https://en.wikipedia.org/wiki/1994_in_video_gaming).[[15]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-15) By mid-1995 the use of motion capture in video game development had become commonplace, and developer/publisher [Acclaim Entertainment](https://en.wikipedia.org/wiki/Acclaim_Entertainment) had gone so far as to have its own in-house motion capture studio built into its headquarters.[[14]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-GPro82-14) [Namco](https://en.wikipedia.org/wiki/Namco)'s 1995 arcade game [*Soul Edge*](https://en.wikipedia.org/wiki/Soul_Edge) used passive optical system markers for motion capture.

During [*Game Developers Conference*](https://en.wikipedia.org/wiki/Game_Developers_Conference) 2016 in San Francisco [*Epic Games*](https://en.wikipedia.org/wiki/Epic_Games) demonstrated full-body motion capture live in Unreal Engine. The whole scene, from the upcoming game [*Hellblade*](https://en.wikipedia.org/wiki/Hellblade:_Senua%27s_Sacrifice) about a woman warrior named Senua, was rendered in real-time. The keynote[[21]](https://en.wikipedia.org/wiki/Motion_capture#cite_note-21) was a collaboration between [*Unreal Engine*](https://en.wikipedia.org/wiki/Unreal_Engine), [*Ninja Theory*](https://en.wikipedia.org/wiki/Ninja_Theory), [*3Lateral*](https://en.wikipedia.org/wiki/3Lateral), [*Cubic Motion*](https://en.wikipedia.org/w/index.php?title=Cubic_Motion&action=edit&redlink=1), [*IKinema*](https://en.wikipedia.org/w/index.php?title=IKinema&action=edit&redlink=1) and [*Xsens*](https://en.wikipedia.org/wiki/Xsens).

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