TEMA TECHNOLOGIE MARKETING AG

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Motion Capture

Most people have heard of the term Motion Capture already. It is not a secret that Motion Capture – commonly referred to as mo-cap – is used a lot in the entertainment industries to record people's body movements and expressions, which then is applied to a digital character to keep the motion as realistic as possible. However, did you know that it is also used in healthcare applications, sports therapy and even the military?

Outside of being used in the production of films and videogames, healthcare professionals may use mo-cap to analyze the movement of patients to diagnose them more accurately. When combined with Virtual Reality, motion capture can also bring a realistic experience which can be used in training experiences for engineers, scientists, and the military.

For the last couple of decades, we have come a long way and are no longer so restricted by hardware. With better technology, faster and more powerful computers, developers from companies of all types and sizes can use motion capture to enhance projects to give users a more realistic experience, as well as opening doors to allow for the development of biomechanical sciences with the ability to analyze full-body data.

What is Motion Capture, exactly? It is the process of recording the movement of real objects or people. In the entertainment industry – filmmaking and video game development – the information gathered from recording these motions is used to animate 2D or 3D digital


https://tinyurl.com/imageonetema

characters or assets. Most of the time in this field, it includes facial and secondary animations – such as finger movements – to produce more accurate, subtle, and realistic final products. In the healthcare industry, the data can instead be used to analyze movements, majorly with the objective of seeing patient progress in rehabilitation scenarios.

Is Motion Capture a modern technology? Not exactly. Motion capture in its more primitive form has been used as early as 1939 with the release of the movie Snow White and the Seven Dwarves. This Disney hit used an early motion capture technique called rotoscoping, which is a time-consuming process where animators would trace a projected live-action film frame by frame into a hand-drawn form. This method of animation assured animators that it was worth it to mimic real people's motions as closely as possible to get the best result.

How does Motion Capture work now? There are currently four methods of modern motion capture: optical (passive and active), inertial, and marker-less. Optical techniques involve markers that either reflect or produce light that is captured by a camera and then used to calculate its position in a 3D space, then recorded. The marker-less technique involves – as the name suggests – no markers and instead, it relies on depth-sensitive cameras and special software to track and record movement from people or objects. Lastly, the inertial method does not necessarily require cameras to operate, however, it uses sensors that measure the rotation and position of where they are placed. These sensors are either gyroscopes, accelerometers, or magnetometers.

Here at TEMA, we use the mo-cap suit developed by Rokoko Electronics, which relies on the inertial motion capture technique. This suit is worn by a person and calibrated with their in-house software Rokoko Studio, which allows wireless and portable motion capture anywhere with its internal hotspot connection. The suit itself contains 18 sensors distributed around the body: head, shoulders, arms, forearms, hands, ribs, hips, legs, ankles, and feet. The six-step setup – wear, connect to software, connect to internet, calibrate, record, export – makes the process fast and easy to get realistic motions implemented into any project. It has so far been used in our Safety Training VR projects to capture specific movements certain non-playable characters (NPCs) had to perform that, if animated in the classic way, would look robotic and inorganic, thus inadvertently taking the player out of an otherwise immersive experience.

These movements were recorded in a real-life scenario by a person, the information was then exported from Rokoko Studio as an "skeleton" and imported into the 3D software Autodesk Maya, where any small errors would be cleaned up and fixed, and finally linked to a meta-human or digital character.

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