

Essay Interactive Visualizations

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My experience with motion capture.

For Interactive Visualizations I helped the telemedicine group with models and animations. For smooth realistic looking animations we decided to use the Xsens motion capture suit, because the UT has one that we can use, and I've had some experience with it from the "goededoelendag".

The MVN BIOMECH motion capture suit.

To capture the motion we have used the MVN BIOMECH suit developed by Xsens. This was the suit available on the UT. The suit has 17 MTx sensor boxes. The MTx uses 3 rate gyroscopes to track rapidly changing orientations in 3D and it measures the directions of gravity and magnetic north to provide a stable reference. The systems real-time algorithm fuses all sensor information to calculate accurate 3D orientation, with a highly dynamic response, which remains stable over time. The suit comes with software that displays the movement and position of the suit on a character in real time. This is the data that will be recorded. The software can export this recorded data in both .bvh and .fbx.

The setup

The setup of the suit was relatively easy, it was a matter of strapping all the sensors onto the correct body part, and connecting all the color coded cables. The two central boxes found all the sensor boxes quickly and displayed them in the software.



The MVN BIOMECH suit

The recording

The recording went on easy, it was just a matter of pressing the record button, acting out the desired movement and stopping the recording.

The problems

After recording the post processing started. Douwe separated the different movements into single .bvh files, because blender could import .bvh. I had tested this, when I imported an existing .bvh I saw the armature (skeleton) move around in blender. So I thought it was an OK. But later on, when I tried to make a model around the armature for telemedicine it wouldn't work, the model moved in unpredictable ways, it was not following the armature. Even after making a new armature from scratch, and have that one copy the location and rotation of the mocap bones it would still not work. After a few more unsuccessful tricks to get it to work Siewart gave it a try in 3dsmax. After a few tries he could finally import more than 100 frames of the mocap data. He could now begin on rigging the characters I've made to the imported armature. This took a long time and needed a lot fine tuning. Because of all these problems and the file size being very large we could not implement the mocap data into the visualization.

Causes

We are not sure what caused all the strange behavior of the exported files in Blender. Examples of working .bvh files in blender are abundant, but so are working exports of xsens (xsens is used by a lot of the best game developers out there, valve, activision, thq, gearbox software etc). We suspect it is caused by an older version of the software that came with the UT MVN suit, but we are not sure.

In the end it was a somewhat unsatisfying experience. The recording was fun, but all the problems it caused were very annoying, because they could not be solved.