

Real-Time puppet motion capture for 3D animation purposes

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MOTIVATION

My idea is to create a Vision-based input method for digital 3D animation that allows the actual performance of the animation in 3D space. This technique is intended primarily for individuals. Consequently it makes digital animation procedures approachable to people who have either insufficient computer skills or prefer alternative input methods.

GOAL

My goal is to develop a 3D animation technique for digital characters which is performed externally by taking advantage of motion capture. Thereby an individual should be able to conduct the procedure in a limited space that requires no actors or stuntmen for performing movements. Instead the user performs the motion with a small puppet which is also represented as a digital character. By creating a Vision-based system (cameras, webcam) to capture the motion, no special technical equipment is required which makes the method inexpensive. Challenges include the recognition of joints of the puppet and furthermore overcoming occlusion of joints. Also real-time capability will be a great challenge, when transferring the motion data on a digital character.

STATE OF THE ART

Motion capture is a widely used procedure in the media industry to allow digital characters life-like movements. Nowadays a great variety of methods is available to capture motion of the human body, which is subsequently transferred to a digital character:

- optical (infrared cameras and LEDs)
- mechanical (exoskeletons)
- magnetic (magnetic fields and sensors)
- inertial (gyroscopes, accelerometers)

The latest developments aim for markerless techniques that require no external devices on the human body. By doing so, it offers an inexpensive and straightforward method with no physical restrictions, as only basic cameras (depth cameras) are required. Drawbacks are still the required space, less accuracy and temporal delays.

PLANNED IMPLEMENTATION

The input method should give instant feedback to be intuitive and therefore requires the data to be processed in real-time. As performance will be of great importance, I would use C++ and OpenCV for the Computer Vision part.

