

Using Captured Human Motion for Whole Body Control of a Humanoid Robot

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0.1 Abstract

This work describes an approach for imitating the motion of a human being using a humanoid robot. The human motion is measured with marker points captured by the 3D motion capture system Vicon. We assume the input measurements of the human motion remains as close as possible to the real motion. As a step toward robotics imitation, we implemented a method mixing the filtering [2] and the inverse kinematics [1] approaches, and applied it to whole body motion of a humanoid artificial system. Our method uses pre-recorded human motion, and converts the captured trajectories into trajectories compatible with the kinematic and dynamic constraints of two humanoid robots: *James* (upper part) and *iCub* (whole body). During the realization of this work, we had a particular attention to obtain a "natural" appearance of the motion, which means that besides the natural and artificial systems show very different characteristics, the way they realize the motion remains similar.

0.2 Conclusion and Future Works

In this work, we have presented a method to generating human-like arm motion with the humanoid robot as the first step for imitating the whole body motion of a human. The experimental results have pointed out that the method has successfully applied to identify various illustrative examples. Currently we working with this model in real-time, future investigations will address more complex problems such as imitation of complete human motion configuration consisting of whole body motion taking on consideration some other constraints for example computing collisions between the body parts of the robot that expected to collide in a particular behavior.

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