Computer Vision
MAP-I Curricular Unit
(CMU certified)

Computer Vision topic review

Human Body Motion Capture Methods

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Background

One of the exciting areas of computer vision (CV) nowadays is human body motion capture (mocap). This CV area is behind some engineering achievements with wide applications in medicine, sports, film, games and entertaining industries.

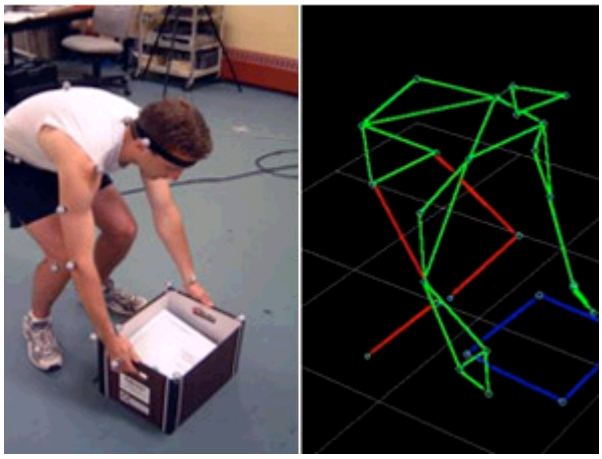

Fig. 1: Mocap scene and skeleton result

Motivation

There are a number of methods to perform mocap with their advantages and disadvantages depending on the mocap target situations.
The main motivation for this review is the understanding of these techniques and discussion with the class of their multiple applications in Computar Vision problems.
The student should also present the application areas and real examples of their use in the different industries.

Starting references

CMU Graphics Lab
http://mocap.cs.cmu.edu/

Biomechanics Yellow Pages - Motion Capture & Analysis International biomechanics community's repository of products for 3D motion capture and analysis.
http://isbweb.org/c/isb/pub/files/orig_website/~byp/Motion_Capture_Analysis.html

Human motion analysis for Motion Capturing Paper of introduction to the beginning of Mocap technologies.
http://www.xsens.com/index.php?mainmenu=technology&submenu=research&subsubmenu=human_motion

Motion Capture Resources
http://www.measurand.com/motion-capture-resources/Motion-Capture-Resources-Home.htm

3D Human Kinematic Modeling and Markerless Motion Capture @ CMU
http://www.cs.cmu.edu/~german/research/HumanApp/humanapp.html

Human Motion: Understanding, Modelling, Capture, and Animation (Computational Imaging and Vision) (Hardcover)
by Bodo Rosenhahn (Editor), Reinhard Klette (Editor), Dimitris Metaxas (Editor)

J. K. Aggarwal and N. Nandhakumar. On the computation of motion of sequences of images - a review. *Proc. of the IEEE*, 76(8):917–934, 1988.

K. Akita. Image sequence analysis of real world human motion. *Pattern Recognition*, 17(1):73–83, 1984.