

Pose Estimation using Low-Level Motion

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Summary

In this talk we hope to present a summary of our recent work demonstrating that pose can be estimated for known gaited actions using just a sparse set of tracked features. Unlike many previous approaches that typically rely on appearance cues, we explore pose estimation using just motion cues alone. The set of motion features used are automatically extracted using a standard feature tracker and contain noise that is not Gaussian in nature, but systematic, due to for example the aperture effect. Furthermore extracted features indiscriminately track both the foreground and background of the scene. A bottom up generative method is used based on the Pictorial Structures representation of Felzenszwalb and Huttenlocher, however, rather than low-level parts being detected based on their appearance, they are detected from their motion; this work is perhaps best described as Pictorial Structures using motion. The presented approach is fully automatic and capable of extracting 3D pose from a single monocular camera. Results are presented for the HumanEva dataset where the same model is shown being applied to different subjects and all camera views contained within the dataset, demonstrating the versatility of the presented approach and the advantages of using a generative model. Qualitative results can be viewed at <http://www.youtube.com/watch?v=WLtBKmskHqc>.

The contents of the talk have been presented in the following publications:

Monocular 3D Human Pose Estimation using Sparse Motion Features

Ben Daubney, David Gibson and Neill Campbell,
Themis - Held in conjunction with ICCV, 2009.

Real-Time Pose Estimation of Articulated Objects using Low-Level Motion

Ben Daubney, David Gibson and Neill Campbell,
CVPR, 2008.

Estimating Gait Phase using Low-Level Motion

Ben Daubney, David Gibson and Neill Campbell,
IEEE workshop on Motion and Video Computing, 2008.