

December 14, 2009

On human actions

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ABSTRACT OF THE TALK

Humans are very good in interpreting other humans' actions. Humans learn from watching each other, they interpret other's intentions and they can even predict what other humans might do. To mimic this capability is attractive for many technical systems: In surveillance and in smart homes, video systems can be used for scene interpretation. In medical systems, human action recognition can be used for rehabilitation applications. And in the context of robot control, teaching-through-demonstration and human-robot collaboration are receive strong research interest.

Major challenges in human action recognition include the recognition from different viewing directions, actions with different scales and parameters and the importance of context. According to neurobiological evidence actions at different complexity level are composed out of action primitives similarly to human speech being composed out of phonemes. In this talk. I will first present a non-supervised approach for learning action primitives and corresponding stochastic grammars based on video-based observations. For learning the primitives, we will make use of the duality between human actions and their effect on the context. Based on the learned primitives and grammars, we can then recognize the action: Here, we will discuss our approach of "tracking in action space", which treats 3D body tracking and action recognition as a joint problem. Classical Bayesian propagation over time will be used for solving the tracking problem in realistic video data.



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