Visual Understanding of Humans Interacting with their Environment

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ABSTRACT

We present a set of works that aim to achieve a high-level understanding and interpretation of human behavior based on the processing and analysis of visual information. In particular, we are interested in scenarios in which humans interact with their environment. We assume that such human-environment interactions are observed by one or more cameras which record videos of the temporal evolution of the scene. We consider four interaction understanding tasks: (a) object state estimation (b) action classification (c) human performance evaluation and (d) action prediction. For these problems, we present the motivation behind solving it, we demonstrate the problem characteristics and challenges and we develop novel methodological approaches that improve the current state of the art. Moreover, we anticipate that the complementarity of these problems and their joint consideration may possibly lead to the improvement of the solution of all of them, as well as to the solution of even more demanding visual understanding problems.