

Dynamic Recognition of Human Actions and Objects using Dual Hierarchical Models

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In the field of image understanding, it is becoming popular to recognize human actions and objects in a scene. Recently, various methods for scene recognition have been proposed, and most of them focus on recognizing human actions and objects in different ways. We consider, however, actions and objects can be recognized complementarily, because human actions are closely related with objects. In this paper, human actions and related objects are represented in dual hierarchical models and recognized by making use of the relationship between them. First, movement of human head and hands are tracked by stereo vision. Features of actions such as position and direction of the head and hands are extracted and input to Dynamic Bayesian Networks to classify actions roughly. Then the actions and related objects are refined by using conceptual models of human actions and objects. Finally, detailed actions and objects are recognized by referring each model cooperatively.

Keywords: Cooperative recognition, Human action recognition, Object recognition, Dynamic Bayesian network