

Dickmanns ED 2013: **Maneuvers as Knowledge Elements for Vision and Control**

Abstract: Visual dynamic scene understanding requires recognition of both 3-D objects in motion and of the overall actual situation in the task domain given. This encompasses knowledge about the links between image features, 3-D objects capable of motion in 3-D space, and about situations. Treatment of these three distinct levels in parallel is achieved by early jumps to 4-D hypotheses on moving objects and the situation given. The system architecture resulting is superior to approaches using inverse perspective projection that start from differences in feature positions between two consecutive images and then proceed to objects in motion and to situations. This embedding in a much richer environment and in a closed-loop real-time fashion allows more efficient tests like prediction error feedback. It provides tools for realizing even complex integrated systems capable of handling strong perturbations with moderate computing power needed.

Stereotypic classes of maneuvers for finite state transitions in appropriate time and corresponding knowledge elements for application under nominal and perturbed conditions are discussed as elements for mission performance. They represent parameterized knowledge about processes in certain task domains with typical environments and objects involved.