

## **VIEW NORMALIZATION OF BODY PART TRAJECTORIES**

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The tracking and detection of people by means of a computerized system of cameras [1] has been the subject of many research projects in the recent time. These systems use different types of models to recognize people in order to track them in a monitored area. Gait modeling is considered in these systems since it is possible to recognize somebody by observing his walk at a distance, and without his cooperation.

Most of the current methods for gait modeling assume that one will be able to observe people from a side view, which is obviously not always the case. Gait modeling for any view is then problematic since the motion of the body parts are distorted by the perspective projection effect. A method is thus proposed in order to obtain normalized body part trajectories for a walking person. This means that body part trajectories are not dependent on the view from which the person is observed, and that the trajectories seem to be observed from a side view. The proposed method does not necessitate a priori knowledge of the scene or the intrinsic and extrinsic camera parameters.

The approach relies on an adequate tracking of important human body parts such as the head, the feet and the hands [2]. The resulting trajectories of the body parts are used in two ways. The head and the feet trajectories are combined to compute the walking trajectory of a person at each half gait cycle. This leads to the detection of the directions changes in the walking trajectory and the formation of apparent walking planes. The trajectories of the head and the feet are then normalized [3] over each of the walking planes in order to make them camera- and trajectory-independent.

[1] A. Branzan Albu et al. "MONNET: Monitoring Pedestrians with a Network of Lossely-Coupled Cameras". In Proc. of the International Conference on Pattern Recognition (ICPR 2006), Hong Kong, China, pp. 924-928, August 20-24, 2006

[2] F. Jean, R. Bergevin and A. Branzan-Albu, "Body Tracking in Human Walk from Monocular Video Sequences", in Proc. of the Second Canadian Conference on Computer and Robot Vision (CRV 2005), Victoria, B.C., Canada, pp. 144-151, May 9-11, 2005.

[3] F. Jean, R. Bergevin and A. Branzan-Albu, "Computing View-normalized Body Parts Trajectories", in Proc. of the Fourth Canadian Conference on Computer and Robot Vision (CRV 2007), Montréal, QC, Canada, pp. 89-96, May 27-30, 2007.