

## Chapter

### Structural, Syntactic, and Statistical Pattern Recognition

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# Structural Human Shape Analysis for Modeling and Recognition

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## Abstract

Structural human shape analysis is not a trivial task. This paper presents a novel method for a structural human shape analysis for modeling and recognition using 3D gait signatures computed from 3D data. The 3D data are obtained from a triangulation-based projector-camera system. To begin with, 3D structural human shape data which are composed of representative poses that occur during the gait cycle of a walking human are acquired. By using interpolation of joint positions, static and dynamic gait features are obtained for modeling and recognition. Ultimately, structural human shape analysis is achieved. Representative results demonstrate that the proposed 3D gait signatures based biometrics provides valid results on real-world 3D data.

## Keywords

Structural Human Shape Analysis Human Walking 3D Human Body Model Model Fitting Modeling 3D Recognition

## References

1. Bhanu, B., Han, J.: *Human Recognition at a Distance in Video*. Springer, London (2011)
2. Nixon, M.S., Tan, T., Chellappa, R.: *Human identification based on gait*. Springer, New York (2005)
3. Nixon, M.S., Carter, J.N.: *Automatic recognition by gait*. *Proc. of the IEEE* 94(11), 2013–2024 (2006)[CrossRef](http://dx.doi.org/10.1109/JPROC.2006.886018)  
(<http://dx.doi.org/10.1109/JPROC.2006.886018>)
4. Murray, M.P., Drought, A.B., Kory, R.C.: *Walking patterns of normal men*. *Journal of Bone and Joint Surgery* 46A(2), 335–360 (1964)
5. Jiang, B., Jia, T.: *Agent-based Simulation of Human Movement Shaped by the Underlying Street Structure*. *International Journal of Geographical Information Science* 25(1) (2011)
6. Yamauchi, K., Bhanu, B., Saito, H.: *Recognition of walking humans in 3D: Initial results*. In: *Proc. of the IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPR Workshops)*, June 20-25, pp. 45–52 (2009)
7. 7.