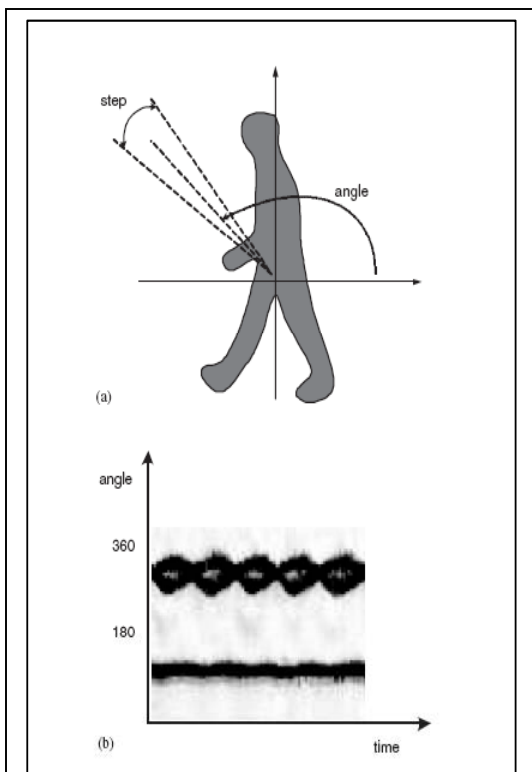


Robust human gait recognition and analysis is a promising biometrics technology finding applications in numerous sectors of our society, including security surveillance applications (e.g., characterization of motion for identification and authentication of individuals, and recognition and detection of suspicious or impostor behaviour in video surveillance) as well as non-security related applications (e.g., detection of postural disturbances due to mobility disorders or aging and optimal technique strategies in sports).

Our objective is to advance the state of the art in reliable gait-assisted recognition algorithms, and to develop an autonomous vision-based system performing fast biometric detection, authentication and analysis for real-time automated diagnostics and surveillance.

Human gait analysis from digital video data includes model based and appearance based approaches. Our work focuses mainly on appearance based methodologies which are more general since they do not rely on specific model but also sensitive to the quality of the acquired data.

The identification rate of our angular gait recognition algorithm can reach as high as 94% at rank 1 and as high as 99% at rank 5 with gait silhouettes from the Gait Challenge database.



Representation of the proposed angular gait recognition transform and extracted features from a silhouette sequence.

Our angular transform method is an appearance-based method which is applied to preprocessed gait silhouettes and offers a computationally efficient solution with recognition rates comparable or better to existing approaches.

Our correlation based approach is a simple yet effective methodology which extracts a gait signature from the dynamics of the relative leg motion. In addition to gait recognition applications it shows high potential for gait analysis in medical diagnostics.

#### Recent Publications:

1. Tahir Amin and D. Hatzinakos, "Wavelet Analysis of Cyclic Human Gait for Recognition", DSP-2009, Santorini, Greece, July 5, 2009
2. T. Amin and D. Hatzinakos, "A correlation based approach to Human gait recognition", Biometrics Symposium 2007, Baltimore, Sept. 11-13, 2007.
3. N. V. Boulgouris, K. N. Plataniotis, and D. Hatzinakos, "Gait recognition using linear time normalization" ELSEVIER Pattern Recognition", Vol. 39, pp. 969-976, May 2006.
4. Haiping Lu, K.N. Plataniotis, A.N. Venetsanopoulos, "Gait recognition through MPCA plus LDA", in Proceedings, IEEE Biometrics Consortium 2006 Biometrics Symposium, IEEE Catalog Number 06EX1426C, September 19-21, 2006.
5. N. V. Boulgouris, K. Plataniotis and D. Hatzinakos, "Gait Reconstruction: A Challenging Signal Processing Technology for Biometric Identification", IEEE Signal Processing Magazine, pp. 78-90, November 2005.
6. N. V. Boulgouris, K.N. Plataniotis, D. Hatzinakos, "An Angular Transform of Gait Sequences for Gait Assisted Recognition", ICIP'04, Singapore, Vol. 2, pp. 857-860, Oct. 24-27, 2004.
7. N. V. Boulgouris, K. Plataniotis, and D. Hatzinakos, "Gait Analysis and recognition using angular transforms", Proc. Canadian Conf. on Electrical and Comp. Eng, CCECE'04, Vol. 3, pp. 1317-1320, Niagara Falls, 2004