

MECHATRONICS

BOOK SERIES

SYSTEM DESIGN AND SIGNAL PROCESSING

VOLUME 2

Editors

Md. Raisuddin Khan

Md. Mozasser Rahman

Muhammad Mahbubur Rashid

Shahrul Na'im Sidek



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CHAPTER 19

HUMAN POSTURE RECOGNITION CLASSIFICATION AND RECOGNITION

Kyaw Kyaw Htike^a, Othman O. Khalifa^a and Lai Weng Kin^b

^aDepartment of Electrical and Computer Engineering, International Islamic University
Malaysia

ali.kyaw@gmail.com

^bCentre for Multimodal Signal Processing, MIMOS Berhad, Technology Park Malaysia, 57000
Kuala Lumpur, Malaysia

19.1 Introduction

In the first stage, the system is trained and evaluated using datasets of human postures to ‘teach’ the system to classify human postures for any future inputs. When the training and evaluation process is deemed satisfactory as measured by *recognition rates*, the trained system is then deployed to recognize human postures in any input video sequence. In the training stage, to obtain the human posture datasets, video sequences have been recorded and pre-processed to extract human silhouettes. The training and testing were performed using four different classifiers which are Multilayer Perceptron Feedforward Neural networks, Self-Organizing Maps, Fuzzy C Means and K Means. The recognition rates (accuracies) of those classifiers were then compared and results indicate that MLP gives the highest recognition rate. Moreover, results show that supervised learning classifiers tend to perform better than unsupervised classifiers for the case of human posture recognition. Furthermore, for each individual classifier, the recognition rate has been found to be proportional to the number of postures trained and evaluated. Performance comparisons between the proposed systems and existing systems were also carried out.

This chapter using dataset A and Iris Flower Dataset (details are shown below).

Table 19.1: Details of Dataset A

Postures	No. of training Samples	No. of testing samples	Total no. of samples	% of no. of testing samples out of total no. of samples
Crawling	315	30	345	8.695652
Lying	259	30	289	10.38062
Sitting	462	30	492	6.097561
Standing	475	30	505	5.940594