

Project No:

Department of Communication Systems

Project Title: Automatic Intelligent Recognition of Human Activities from Wearable Sensors

Degree Scheme: CCS ITM ECS TCS

Level: BSc/BEng MSci/MEng

Supervisor: Dr. P Angelov 2nd Supervisor: Dr. Z Ding
Assistant: Mr. J. Andreu

Project Description:

The aim of this project is to recognize in an automatic way which activity a subject is performing (running, walking, cooking, tidying, studying, stretching...). To address this challenging problem that is of great need in the future Ambient Assistant Living systems we will study and develop software that collect and transmit in a wireless manner data from wearable sensors as well as software and algorithms for automatically classifying these data into different activities. Previous research made advances over motion data. Future steps on this research aims to add new data sources to the system such as Brain-Computer interfaces and heart rate/pulse data and also new improvements into the feature extraction and data analysis process. Future applications of this exciting project might be assisted living, sport training, elderly care and soldiers monitoring.

The student who selects this project will learn fundamentals of wireless sensor programming and intelligent classifications methods, both of which will add valuable high-tech knowledge and skills to the student's future carrier. There is a clear potential (subject to results and performance) that the project may lead to publications (research papers) which itself can be a valuable addition to student's CV.

Skills required: Programming in Java, Matlab, filtering and classification of data

References:

[1] J. Andreu, P. Angelov "On-line Activity Recognition from Wireless Sensors using Evolving Fuzzy Systems" WCCCI2010 IEEE *World Congress on Computational Intelligence, Barcelona, Spain, 18-23 July 2010, to appear*

[2] J. Mantyjarvi, J. Himberg and T. Seppanen, "Recognizing human motion with multiple acceleration sensors" *IEEE Intern. Conf. on Systems, Man, and Cybernetics*, pp. 747-752, 2001.