

[O17] Target Classification And Tracking Using Acoustic Micro-Doppler Signatures

This proposal aims to investigate the processing techniques which may be applied to acoustic micro-Doppler signature (μ -DS) data. Specifically, methods to extract, classify and track, the μ -DS of individual targets in the presence of background clutter and non-target backscatter signals will be developed. The proposed programme will build on existing radio frequency (RF) μ -DS research conducted at University College London. This will be carried out in combination with some novel acoustic signal processing approaches and will be supported by a data acquisition programme and signature characterization activities.

The proposed work is based upon the collection or simulation of suitable acoustic data followed by micro-Doppler signal extraction. The experimental equipment should allow a wide range of transmitted waveforms to be investigated and optimised for the target signatures required. The extracted data will then be classified using both methods developed at UCL for RF micro-Doppler data and methods particularly suitable for acoustic data such as those used in speech recognition. Signal processing methods will be developed to characterise target data and will include correction for the acoustic regime propagation conditions. Tracking filter techniques can then be applied to the data and some initial investigation of track classification methods made. This work will be closely supported by our Industrial collaborators, all of whom have significant expertise in acoustic technology. This input will help to ensure that commercially and practically viable ideas are developed.

Project Supervisor : Dr. Karl Woodbridge

Dr. Karl Woodbridge joined University College London in 1990 after 11 years working for Philips Electronics latterly as a project manager in the semiconductor electronics area. He is currently a Reader in Electronic Engineering in the Sensor Systems and Circuits group. He has research interests in the semiconductor and RF sensor areas. His RF research interests are mainly centered on radar sensors and networks. Current RF research activities at UCL include multi-static and netted radar systems, radar target detection, tracking and classification, terrain and marine radar sensing and pervasive passive detection using wireless transmissions. His research activities have been carried out in research investigator and technical consultancy roles for a wide range of customers in the civil and defence areas. He is a Chartered Engineer, a Fellow of the IET, a Fellow of the Institute of Physics and a visiting Professor in the Radar and Remote Sensing Group at the University of Cape Town. He has published or presented over 170 journal and conference papers in the above areas.