

Distributed Coherent Sensing and Signal Processing for Temporally and Spatially Sparse RF Networks

UK Nationals ONLY

A major UK aerospace and defence company has an interest in research which is aimed at collaborative signal processing to support spatially distributed networks of sensors which use RF for communication. While the work is driven by potential military requirements associated with unattended ground sensor networks it is expected that there could be many commercial spin-off's in the civil telecoms and security domains. This project will concentrate on signal processing across networks of sensors for detection and location, with a particular emphasis on sensors which transmit on an intermittent and temporally sparse basis

The project will need to address two complementary and inter-related functionalities which have a number of common technical features:

1. Self location of multiple RF emitter resources that have sparse 'on-air' transmission characteristics. Such sources may also exhibit adaptive frequency, power output, and/or transmission times, for example, dependent on their associated sensor functions, the need to conserve and optimise available power, and the need for operational covertness. The spatial layout of the emitters may exhibit dynamic behaviour if the sensors are mobile, and/or sensors are added or removed from the network.
2. Use of multiple RF sensing resources to provide detection and localisation of 'external' RF and other signature waveforms, for both new 'self resource' and identification of potential external threats

The project will involve close interaction with the company who are likely to want to recruit the student after successful completion of the 3 year PhD programme.

The successful candidate will hold or expect to hold a first or good 2.1 degree in electronics, physics, mathematics or related discipline and have a strong interest in signal processing and/or mathematical algorithm development.

B.Mulgrew@ed.ac.uk