Bi-static/Multi-static Radar
H. Griffiths, M. Ritchie, K. Woodbridge

The group is a pioneering research team in the area of bistatic and multi-static radar systems. This has been demonstrated by the awarding of the IET A.F. Harvey award to Hugh Griffiths for his work in this field.

We have developed our own multi-static radar system, NetRAD, which has been used during numerous trials. Experiments have ranged from novel work on monostatic and bistatic sea clutter analysis to passive WiFi detection.

Potential advantages for bistatic/multistatic systems are: counter-stealth abilities, more immune to EW techniques, reduced size and weight of passive nodes, extra degrees of freedom which provide more information on target and background.

Sea-clutter/Martine Target Analysis
M. Ritchie, H. Griffiths, K. Woodbridge

Through the improved understanding of the behaviour of sea clutter returns significant improvements can be made in the detection of targets in the maritime environment. Experimental campaigns in the UK and South Africa have given new insight into the behaviour of sea clutter.

The focus of this research has been on the characterisation of the changes in sea clutter statistics as a function of Doppler. The conclusions from this work directly affect the way detection algorithms should be applied in the Doppler domain.

Collision Avoidance Maritime Radar
S. Halai, P. V. Brennan

Researchers in the group have developed an omni-directional collision avoidance radar system for port manoeuvring of large vessels in collaboration with Guidance Microwave. The novel aspect of the radar is that it has no electrical or mechanical steering but range and bearing to a target can still be determined.

Microwave-Optical Tissue Oxygenation Monitor
A. Al-Armaghany, T. Leung, K. Tong

A newly developed sensor exploits a innovative type of bio-compatible antenna to induce a local temperature rise in muscle tissue while maintaining low temperature in the superficial layers. The elevated tissue temperature produces alteration in human thermoregulation, which is measured by the integrated optical sensors using near infrared Spectroscopy. Physiological response in the deep tissue can provide valuable information toward the study of various vascular diseases.

Modelling the Topside EM Environment of Ships
A. Ghahrb, D. Andrews, H. Griffiths

A naval ship contains a large number of electrical and electronic systems within a confined space. Electromagnetic Interference (EMI) between these systems can cause performance degradation of the on-board systems. Computational Electromagnetic (CEM) tools can be used to predict the topside EMI levels early on in the design phase. Research in the UCL radar group is working to exploit these tools and validate their predictions against measurements of scale models.

Passive WiFi Radar
B. Tan, K. Chetty, K. Woodbridge

The group, in collaboration with the Dept. of Security and Crime Science, is pioneering the use of WiFi access points, as transmitters of opportunity in passive radar systems. The technology has been demonstrated as a means of detecting the movement of humans through walls. Its applications could be numerous, including security systems for intruder detections in scenarios where CCTV does not provide adequate coverage.

Radar Imaging of Avalanches
M. Ash, M. Ardeshir-Tarha, P. V. Brennan

Avalanches pose a significant threat to human life and settlements. Researchers in the group have developed a high-resolution radar that has been recording avalanches for three winter seasons. It operates in a bunker facing a slope of an avalanche-prone mountain. The radar data that it has produced to date has been of unparalleled quality and is helping geophysicists to improve their understanding of avalanche dynamics.

The group has recently received funding from NERC to develop a new radar system for improved cross-range resolution.