**PhD Project Proposal**

School of Electronics, Electrical Engineering and Computer Science

& ECIT Global Research Institute

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| **Proposed Project Title: Self-steered antennas for wireless power transfer** |
| **Principal Supervisor: Dr Neil Buchanan Second Supervisor: Prof Vincent Fusco** |
| **Project Description:**  Wireless power transfer (WPT) has the potential to power electronic devices at distance, removing need for rechargeable batteries, allowing 24/7 operation. An exciting new project [1] is commencing at ECIT in 2019 with the aim of wirelessly powering a drone, removing the current limitation on drone flight time of around 20 minutes, allowing continuous operation. A significant challenge is to ensure that the microwave beam conveying the power is always perfectly focused towards the drone, automatically compensating for any change in the drone’s position. Self-steered antennas (often known as retrodirective antennas) can perform this function, although there is little practical demonstrations of these antennas for high power WPT applications. The PhD will look at the current state of the art in self steered antennas and simulate solutions that are suitable for WPT. There will also be a significant focus on producing practical demonstrations of a self-steered antenna which can convey wireless power efficiently. The final solution of the self-steered antenna could rely on analogue or digital technology or both, depending on the results of the earlier feasibility studies and on the particular strengths of the candidate.  [1] <https://www.theengineer.co.uk/drones-microwave-beams/> |
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