**PhD Project Proposal**

School of Electronics, Electrical Engineering and Computer Science

& ECIT Global Research Institute

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| **Proposed Project Title: Novel Injection Locked Transceivers for RFID and Healthcare** |
| **Principal Supervisor: Dr Neil Buchanan Second Supervisor: Prof Vincent Fusco** |
| **Project Description:**  Chipless RFID is where a simple pattern can be inkjet printed onto an item in a similar way to a bar code. This unique code than be read with an RF/Microwave based reader. Although the RFID tags can be very simple, the reader hardware is very complicated. QUB has made some promising advances using injection locking techniques to provide an incredibly simple RFID reader1,2, which has been successfully demonstrated with chip less RFID. Several attributes of the injection locking techniques, also make them useful for healthcare sensors, where LED based optic pulse sensors and ECG sensors can be replaced by a simple microwave sensor that could acquire as much data by a patient, going about their everyday life, as a clinical ECG test. This PhD study will look into innovative approaches where injection locking techniques will be combined with phased locked loop (PLL) techniques to form highly sensitive transceivers and sensors. There is potential for new architectures to result from this study, adding significant novelty. This research will offer a high impact in a short timeframe due to its direct “real world” applications.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  1. N.B. Buchanan, V. Fusco, “Simplified, high performance transceiver for phase modulated RFID applications”, European Microwave Conference, Paris, Sep 2015  2. N.B. Buchanan, V. Fusco, “Single VCO chipless RFID near-field reader” Electronics Letters, Volume 52, Issue 23, 10 November 2016, p. 1958 – 1960 |
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