

# Postgraduate Studentships Queen's Doctoral Training Programme on Secure Connected Intelligent Design and Manufacturing

School of Electronics, Electrical Engineering and Computer Science

PhD Studentship 2020/21

<b>Proposed Project Title:</b> DTP: Smart manufactured nanostructured plasmonic arrays for biosensing	
<b>Principal Supervisor:</b> Dr David McNeill  <b>Contact Details:</b> <b>QUB Address:</b> Room 07.012, Ashby Building, Stranmillis Road, Belfast, BT9 5AH. <b>Tele No:</b> +44 (2890) 974534 <b>E-Mail:</b> dw.mcneill@qub.ac.uk	<b>Research Area</b> Sensors theme within Energy, Power & Intelligent Control (EPIC) cluster <b>Proposal open to other School (indicate area of Interest)</b> Graduates from disciplines related to Electrical & Electronic Engineering or Physics preferred. Applications will be considered from graduates of other engineering or scientific disciplines.
<b>Degree linked to ELE: Electrical &amp; Electronic Engineering or Software &amp; Electronic Systems Engineering</b>	
<b>Degree linked to CSC</b>	
<p>This project is part of the Queen's Doctoral Training Programme in Secure Connected Intelligent Design and Manufacturing. Many of today's industrial approaches require transformative changes to ensure long term societal, economic and environmental resilience and sustainability. PhD projects in this programme explore the potential of emerging digital technologies, such as artificial intelligence, robotics, and the Internet of Things, to transform the way we design, manufacture and operate products and services.</p> <p>The programme offers a bespoke research and training programme that aims to develop students into cross-disciplinary, industry-conscious thinkers and leaders who will influence the roadmaps of future advanced manufacturing technologies and their applications. They will have a balanced understanding of ICT (security, communications and data analytics) in the context of their application to Advanced Manufacturing and High Value Design.</p>	
<b>Project Description:</b> This project is a collaboration between the School of Mathematics & Physics (M&P) and the School of Electronics, Electrical Engineering & Computer Science (EEECS). It brings together state-of-the-art manufacturing and advanced optical physics at the nanoscale, with the potential to revolutionise biological detection. The student will design and fabricate nanostructured arrays using the high-precision Nanoscribe 3D printer, housed in the QAMEC laboratory in EEECS, under the supervision of Dr David McNeill. These nanostructures will be characterised by high-resolution electron microscopy and the plasmonic properties of the arrays will be determined optically. The characterisation will mainly be carried out in M&P under the supervision of second supervisor, Dr Bob Pollard. Industrial interest in the project has been expressed by Causeway Sensors, a QUB spin-off specialising in biosensing.	
<b>Objectives:</b> <ul style="list-style-type: none"><li>• Design, fabricate and characterise optically resonant nanostructures.</li><li>• Investigate the scale-up of such nanostructures for large-scale manufacture.</li><li>• Make recommendations for the implementation of nanostructures in biological testing environments.</li><li>•</li></ul>	
<b>Academic Requirements:</b> <p>A minimum 2.1 honours degree or equivalent in Computer Science or Electrical and Electronic Engineering or relevant degree is required.</p>	
<b>GENERAL INFORMATION</b> <p>This 3.5 year PhD studentship, potentially funded by the Department for Employment and Learning (DfE), commences on 1 October 2020.</p> <p>Eligibility for both fees and maintenance (approximately £15,000) depends on the applicants being either an ordinary UK resident or those EU residents who have lived permanently in the UK for the 3 years immediately preceding the</p>	

start of the studentship. Non UK residents who hold EU residency may also apply but if successful may receive fees only.

Applicants should apply electronically through the Queen's online application portal at: <https://dap.qub.ac.uk/portal/>

Further information available at: <https://www.qub.ac.uk/schools/eeecs/Research/PhDStudy/>

**Closing date for applications: 15 March 2020**