

# 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: DTP: Embedding intentions in robot motion patterns: capitalizing on human perceptual skills</b>	
<b>Principal Supervisor: Dr. Joost C. Dessing</b> <b>Second Supervisor: Prof Seán McLoone</b>	<b>Research Area</b> Psychology, Computer Science
<b>Contact Details: School of Psychology, David Keir Building, 18-30 Malone Road, BT9 5BN</b> <b>QUB Address</b> <b>Tele No: 028-90975650</b> <b>E-Mail: j.dessing@qub.ac.uk</b>	<b>Proposal open to other School (indicate area of Interest)</b>
<b>Degree linked to PSY</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> <p>Robots are used widely in manufacturing environments, although currently these operate in cages to keep humans away for safety reasons. Manufacturing environments of the future will involve humans interacting with robots at close distance. In this future vision, human and robot form a team working together to achieve assembly tasks. Optimizing this team work in terms of efficiency is a central research challenge both for engineers and psychologists (i.e., what human-robot coordination is most efficient and leads to happy and satisfied human operators). A key factor will be how both human and robot are able to anticipate aspects of the upcoming action of their team mate. It is known that human motion patterns contain information that can be used for this anticipation. Humans are indeed able to pick up and use this information; this is called biological motion perception. This PhD project will address the question of how human actors perceive and anticipate robotic motion. It will examine what robotic motion patterns provide the best information to human actors interacting with the robot: is it optimal to move the robot according to smooth, human-like movement trajectories, or are exaggerations required to amplify pertinent information?</p>	

**Objectives:**

This project is expected provide insights into human perceptual capabilities and how to shape human-robot interactions to capitalize on these capabilities.

**Academic Requirements:**

A minimum 2.1 honours degree or equivalent in Psychology or relevant degree is required.

**GENERAL INFORMATION**

This 3.5 year PhD studentship, potentially funded by the Department for Employment and Learning (DfE), commences on 1 October 2020.

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 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**