# PhD Project Proposal

ECIT Interdisciplinary PhD Programme

Proposed Project Title: Securing collaborative high value design

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Principal Supervisor(s): Dr T Robinson (SMAE)

Project Description:

Within high value engineering the Digital Mock-Up (DMU) is the virtual representation of the product. It is used for design, validation, manufacturing and manufacturing planning. The DMU is comprised of Computer-Aided Design (CAD) models which represent the geometry of the components in the product, and it includes additional information relevant for manufacture and assembly (e.g. material properties, manufacturing tolerances etc). For complex products (e.g. aircraft, cars etc) the design and manufacturing are carried out across many sites, often distributed across the globe. While sharing access to the DMU is essential for an effective engineering operation, doing so poses extreme risks to a company as they are forced to share access to the product DMU with large number of engineers across multiple sites, while needing to protect the extremely valuable IP the models contain. Also, in industries such as aerospace, many projects are collaborative or risk sharing partnerships between many companies. Such collaborative projects often bring together companies that may also be competitors on different products. Therefore, even when information is shared within a programme, the amount of information shared, and extent to which it is shared, needs to be highly controlled.
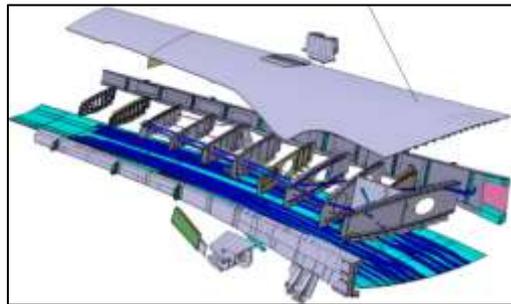
A DMU for an aircraft wing[1]

This project will conduct research into data and hardware security. This PhD will focus on user centric usable security. It will be achieved by outsourcing the monitoring and management of user security to a trusted cloud-based platform that is assisted by sensing, monitoring and countermeasure technology located on the user's connected device.

[1]http://www.muelaner.com/part-to-part-assembly/a-new-paradigm-in-large-scale-assembly-research-priorities-in-measurement-assisted-assembly/

Objectives:

- Investigate the usability challenges in a high-value engineering context from an engineer's perspective.
- Investigate the ability to ..

Academic Requirements:

Students entering the programme will normally be required to have a 2.1 BSc/BEng in Computer Science, Electrical and Electronic Engineering, or a maths based engineering or physical science degree, or equivalent qualification recognised by the University. Students holding an appropriate MEng or MSc (Software conversion) will normally be

required to have a 2.1 or commendation (distinction) respectively. Furthermore, additional criteria may be applied. All applicants must have significant mathematical and programming experience.

GENERAL INFORMATION:
This 4 year PhD studentship, potentially funded by the Department for Employment and Learning (DEL), commences on 1 October 2019.

Eligibility for both fees and maintenance 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/

Deadline for applications: Friday 1 March 2019

Contact details:

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