Newcastle University PhD Studentship Award

Title
Security and Privacy of Medical IoT Devices

Value of award
Full UK/EU fees (eligibility criteria applies to EU students) and annual living allowance of £14,777 (at the 2018/19 UKRI rate)

Number of awards
1

Start date and duration
To start before September 2019, 3.5 years

Application closing date
15th February 2019

Overview
As the world population is aging, the healthcare industry is rapidly delivering high-tech solutions. The proliferation of medical smart devices is greatly improving patient outcomes and reducing healthcare costs. Examples include smart bras (thermal imaging for breast cancer), toilets (analysis of urine/stool for markers of disease), toothbrushes (salivary diagnostics), and scales (measuring of visceral fat, bone mass, etc.). The information gathered via these devices is increasingly accessible to medical professionals to better inform patient management decisions. However, this highly-sensitive personal medical data is also at risk of hacking through various ways such as exploiting security flaws in the hardware and software, side channel attacks, and social engineering attacks.

Accurate health assessment often relies on multiple sources of information/biomarkers which can be provided via multiple smart medical devices. In the same manner, by gathering data about users from multiple devices, it is easier to threaten their privacy and security. This project aims to study the functionality and security of medical IoT devices used in combination with the aim of improving diagnostic accuracy while simultaneously preserving data security and patient privacy. The successful candidate will A) study and analyse the data generated by smart medical devices in a complementary manner to improve diagnosis, B) study the protection mechanisms available on these devices and investigate the security and privacy issues when used in combination, and C) explore potential solutions to keep the balance between functionality and security of medical IoT devices.

The student is expected to have a strong interest in interdisciplinary projects and practical problem solving. Previous experience with programming and data analysis is essential. Basic understanding of hardware and software security, IoT platforms, smart medical devices, medical diagnostics is desirable but not essential.

Sponsor
Engineering and Physical Sciences Research Council

Name of supervisor(s)
Dr Maryam Mehrnezhad
Dr James C. Knight Stirling
Prof Aad van Moorsel
Eligibility Criteria
You must have, or expect to achieve, at least a 2:1 honours degree or international equivalent, in Computing Science, Bioinformatics, Electrical and Electronic Engineering, Software Engineering, or a related subject.

How to apply
You must apply through the University’s online postgraduate application system. To do this please ‘Create a new account’. All relevant fields marked with a red asterisk must to be completed. The following information will help us to process your application. You will need to:

- Insert the programme code 8050F in the programme of study section
- Select ‘PhD Computer Science - (Computing Science) as the programme of study
- Insert the studentship code COMP012 in the studentship/partnership reference field
- Attach a covering letter and CV. The covering letter must state the title of the studentship, quote reference code COMP012 and state how your interests and experience relate to the project
- Attach degree transcripts and certificates and, if English is not your first language, a copy of your English language qualifications

Please also send a copy of your CV and covering letter to computing.phd@ncl.ac.uk

Contact
Dr Maryam Mehrnezhad, Dr James C. Knight Stirling