

## PhD Studentship - Network Security and Mitigation Techniques in Software Defined Networks

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### **Project Detail:**

Software Defined Networks have transformed the current networking environment by offering scalability, programmability and flexibility in the network architecture. However, even though SDNs make it easier to mitigate specific attacks, such as DoS, they open up the space for new types of attack. Currently, OpenFlow, is the most popular SDN implementation and is used in some production environments.

The successful applicant will perform high-quality research, at Wolfson School's "Signal Processing and Networks" research group, in topics related to computer networks and network security. Therefore, a strong background in computer network communications is essential (e.g. the OSI stack). A core element of this project will be advanced network attacks, threat detection and mitigation techniques implemented in distributed SDN networks using the OpenFlow protocol (or equivalent). Of particular research interest to this project for achieving these goals are the following tools: pattern recognition for advanced network attacks, machine learning and statistical algorithms for anomaly-based intrusion detection, distributed algorithms and game theory. Development and research on some of these tools will be the "heart" of the research project.

In addition the project will follow a practical/demonstrable approach, rather than restrict in theoretical approaches, and therefore, network traffic measurements and network architecture vulnerability exploration are going to be elements of the project.

### **Entry requirements:**

Applicants should have, or expect to achieve, at least a 2:1 Honours degree (or equivalent) in Electronic/Electrical Engineering, Computer Science or a related subject. A relevant Master's degree and/or experience in one or more of the following will be an advantage: Machine Learning, Network Security, Signal Processing, Game Theory, OpenFlow

Candidates may check the International qualification equivalencies by clicking this [link](#).

**Skills:**

High level knowledge of computer networks and the communication protocol stack (TCP/IP stack) and network traffic monitoring are required. Good analytical research and communication skills are essential. The successful candidate is also expected to be an enthusiastic team player who can work both independently and with others.

Strong, demonstrable coding skills in C, Python or MATLAB and Linux OS are desirable. Experience with machine learning techniques and mathematical frameworks for decision making are desirable.

All applicants must also meet the minimum English language requirements, details of which are available on the [Loughborough University website](#).

**Funding information:**

Please note that these studentships will be awarded on a competitive basis to applicants who have applied to this project and/or the following 30 projects that have been prioritised for funding; job advert ref: WS01 – WS30

If awarded, each 3 year studentship will provide a tax-free stipend of £14,786 p.a (provisional), plus tuition fees at the UK/EU rate (currently £4,262 p.a). While we welcome applications from non EU nationals, please be advised that due to funding restrictions it will only be possible to fund the tuition fees at the international rate and no stipend will be available. Successful candidates will be notified by 30th April 2018.

**Contact details:**

Name: Dr. Konstantinos Kyriakopoulos

Contact Dr Kyriakopoulos at “elkk [at] lboro.ac.uk” with email subject “SDN 2018”.

Apply: <https://goo.gl/DGEG4g>

<b>Qualification type:</b>	PhD
<b>Location:</b>	Loughborough
<b>Funding for:</b>	UK Students, EU Students
<b>Funding amount:</b>	£14,786 per annum
<b>Hours:</b>	Full Time

<b>Placed on:</b>	18th December 2017
<b>Closes:</b>	9th March 2018
<b>Reference:</b>	WS06