

## WLAN Security

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A Wireless Intruder Detection System (WIDS) is a defence system that detects hostile activities in an IEEE 802.11 network, commonly known as Wireless Local Area Networks (WLAN). Probing is the first communication that an active intruder perform on an Access Point (AP). Early detection of unauthorised probing is crucial, as probing attacks can be the basis of other attacks in a Small Office/Home office (SOHO) Network.

In Ratnayake et al. (2014) a prototype of an anomaly based WIDS is designed, employing a supervised feedforward Neural Network (NN) classifier that classify genuine frames from rogue frames, to detect a probe request attacks in SOHO WLANs. The overall simulation results showed that the probe request attack classifier performs 96.5% accurately, when it is applied to real-world WLAN data.

WPA3 protocol (2018) comes with four major features: a new, more secure handshake for establishing connections, an easy method to securely add new devices to a network, some basic protection when using open hotspots, and finally increased key sizes. However, probing vulnerabilities still remain the same.

We would like invite a PhD student to further develop this research to the next levels of novel methods and strategies. Depending on your interest, abilities and experience, the project may be orientated more either towards development of an IDPS (one option would be developing the existing IDPS to a self-contained, self-learning IDPS) or improving the security architecture of the WLAN.

This research is multidisciplinary which applies to Networking, Network Security and AI. Applicants are required to have a strong first degree or Master's degree in Computer Science, or an area relevant to the project. Excellent network and security knowledge and skills are essential. Skills in scripting, programming, cryptography, AI and a simulator such as MATLAB is desirable.

The ideal candidate will be self-motivated with good writing and communication skills. The PhD student will be supervised by Dr. Deepthi Ratnayake (d.ratnayake@herts.ac.uk), whom interested candidates are invited to contact via email in the first instance.