UNIVERSITY OF Southampton
School of Electronics and Computer Science

Bid for funded project to develop resources around CyBOK 1.0

Development of redistributable laboratory materials for wireless remote control

Proposers

- Dr Denis A Nicole. Co-leader of outreach programmes, ACE CSE & Reader in Electronics and Computer Science, University of Southampton.
- Mr Joshua S Curry. Postgraduate research student, Electronics and Computer Science, University of Southampton.

Purpose

This bid intends to develop tools to support HEI educators in developing student understanding of the CyBOK *Physical Layer & Telecommunications Security Knowledge Area,* in particular aspect 3.4: *Attacks on Physical Layer Identification.* It will give low-cost practical hands-on training in both *signal replay* and *feature replay* attacks.

Background

In the *Security of Cyber-Physical Systems* module which forms part of our GCHQ-accredited MEng and MSc degrees, we have used low-cost low cost *wireless garage door openers* along with *software defined radios* (Lime SDR) to investigate and take over control of a typical home door remote control. This not only develops understanding of real-world over-the-air protocols, but involves the use of both straightforward replay attacks, and feature replay attacks, based on a detailed understanding of the integrated circuits in use. This not only gives hands-on understanding of real protocols, it also allows wider lessons to be drawn about the vulnerability of "grey" imports in a little-regulated market.

We now seek funding to allow us to develop the laboratory into a form suitable for sharing with the wider community, Within the funding, we will also extend the laboratory to allow use of lower cost (RTL-SDR) software radios for network monitoring, and the use of alternative low-cost transmitters. The laboratory gives a good introduction to wider SDR techniques, including the use of *Gnu Radio* alongside *waterfall* and other visualisations.

Value of Bid

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