Internship/Bachelor’s Thesis

Implementation of an Augmented Reality Android Application for Network Surveillance

Motivation and Task Description
Large sensor networks are an emerging trend in industry. Dynamically routed mesh networks provide multiple signal paths, which leads to increased network reliability. But such networks are also susceptible to routing attacks, where malicious network participants attract traffic towards themselves and do not forward it to the destination, e.g. blackhole it.

Such attacks can be detected by reading through network logs, but this process is cumbersome and it might take too long, until the attack is detected.

In this thesis, a virtual reality application for Android OS shall be developed, which aids in convenient and early detection of network anomalies and attacks.

By pointing the smartphone’s camera at a particular sensor node, an overlay shall be placed above the camera image. The overlay provides information on network traffic and statistics concerning this particular sensor node. Hence, network anomalies and attacks can be detected at a glance.

Your tasks include, but are not limited to:

- Familiarize with an image processing framework for Android OS, e.g. OpenCV, for visual identification of sensor nodes.
- Utilize the smartphone’s built-in WiFi adapter to communicate with other network members.
- Develop an overlay layer to be displayed above the live camera image showing relevant network parameters. Network data are provided.

Prerequisites

- Interest in and basic understanding of attacks on wireless sensor networks.
- Basic understanding of developing apps for Android OS

Contact

Martin Striegel
Phone: +49 89 322-9986-121
E-Mail: martin.striegel@aisec.fraunhofer.de

Carsten Rolfes
Phone: +49 89 322-9986-126
E-Mail: carsten.rolfes@aisec.fraunhofer.de

Fraunhofer Research Institution for Applied and Integrated Security (AISEC)
Hardware Security
Parkring 4, 85748 Garching (near Munich), Germany