Chair of Security in Information Technology
TUM Department of Electrical and Computer Engineering
Technical University of Munich

Forschungspraxis, Interdisciplinary Project

Automotive radio analysis framework (AISEC)

Modern cars use besides well known wireless standards like WLAN or Bluetooth, a plethora of proprietary radio communication protocols. For example, current tire pressure is transmitted via Ultrahigh Frequency (UHF) to a controller in the car. Radio Data System (RDS) is also still used to embed information like traffic messages, title names or sender logos into FM radio broadcasting. As a final example, radio keys use Low Frequency (LF) as well as UHF to implement different functions to unlock and start the car. Especially Remote Keyless Entry (RKE) is highly popular although implementing little security.
This work shall develop a framework to test automotive wireless services. The main focus should lie with vehicle keys and immobilizers. First of all, devices to analyse LF as well as UHF should be integrated and as necessary expanded. Based on this, tests shall be conceived, like testing RKE for replay or relay vulnerabilities. Finally, these tests may be optimized, e.g. by tuning antenna or other hardware to increase distance.

Prerequisites

The following list of prerequisites is neither complete nor binding, but shall give you an idea, what the topic is about:
- Experience with radio communication basics (Modulation, Encoding, ...)
- Experience in programming for embedded devices
- Ability to work self-directed and systematically

Please attach a current grade sheet and a short CV to your application so that we can assess your qualification for the topic of your choice.

Contact

Nikolai Puch
Sebastian Peters
Phone: +49 89 322-9986-142
Phone: +49 89 322-9986-1037
E-mail: nikolai.puch@aisec.fraunhofer.de
E-mail: sebastian.peters@aisec.fraunhofer.de
Fraunhofer Research Institute for Applied and Integrated Security AISEC
Department Product Protection and Industrial Security Lichtenbergstraße 11, 85748 Garching near Munich, Germany https://www.aisec.fraunhofer.de

Advisors

Georg Sigl
Nicolai Puch, Sebastian Peters (Fraunhofer AISEC)