Bachelor and Master Project / Bachelor- und Masterarbeit

Reliability Test and Evaluation of Physical Unclonable Functions

Introduction: Nowadays, the number of connected devices is increasing steadily. These devices work together in several cyber-physical systems such as vehicles, airplanes, clinical devices, etc. and especially embedded devices connected to the internet so-called internet of things (IoT).

Cloning attacks are considered as series security challenges and threats for IoT devices. In this attack scenario, an adversary tries to clone the device identity or the secret keys stored in a device memory. As a countermeasure, Physical Unclonable Function (PUF) is presented as a key generator instead of storing the secret key in a memory. PUF acts as a device-identity which is very hard to clone. Unfortunately, PUF exhibits a very low level of reliability as an analog silicon function. Therefore, it is very important to study and analyze PUF reliability.

This project aims to show how to evaluate PUF-reliability. Then, we will design a reliability test of PUF and apply this test on different types of PUFs such as arbiter and ring oscillator PUFs.

Research Objectives: The work plan contains four steps as follow:

1) Studying and reviewing the published PUFs.
2) Studying the reliability principles of silicon circuits.
3) Devising a threshold method to evaluate PUF-reliability .
4) Implementing the designed test and compare between different types of PUFs.

Applications of the research results:
Jupiter.

Prerequisites/Requirements: Students should have good background in security or reliability, and programming languages are also required.

Starting Date: To be agreed on with the interested party.

Interested students are kindly asked to contact:

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