Bachelor’s Thesis, Forschungspraxis, Master’s Thesis:
Side-Channel Attack on PUF Primitives Using Localized EM

Cryptographic key storage is an important requirement in embedded devices. Physical Unclonable Functions (PUFs) provide a cost-efficient alternative to secure key storage. They exploit manufacturing variations to derive device-specific secrets for key storage and device authentication.

Side-channel analysis (SCA) of PUFs exploits the fact, that certain characteristics of the PUF structures and their surrounding evaluation circuitry can be observed by an attacker, e.g. by high-resolution localized EM measurements [1,2].

Depending on your background and type of work, possible tasks of this project include

• Get familiar with PUF primitives and their implementation
• Implement a PUF design (VHDL)
• Develop/Extend a measurement set-up for localized EM side-channel analysis (Python)
• Perform SCA on PUF primitives using the IC scanner positioning system in our lab

This work can be conducted in English or German. In case of high quality of the work, results might be published.

Prerequisites:

• Basic knowledge of lab equipment (e.g. oscilloscope, voltage supply, …)
• Good programming skills in Python
• Basic experience in the field of digital design (ideally VHDL/Vivado/Xilinx FPGAs)

References


If you are interested in the topic or have further questions contact

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