

Master thesis internship: Hardware security

Countermeasures against power-off laser fault attacks

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Starting February/March 2022

1 Context of the internship

Secure circuits and systems, like electronic passports, smartcards, or more complex connected objects, are subject to attacks that exploit hardware vulnerabilities. Active attacks are particularly threatening and consist in injecting faults at run time to obtain secret data or unauthorized access. Among the various techniques developed to mitigate these threats is the use of hardware security primitives directly integrated inside the secure circuits. The state-of-the-art of active attacks is almost exclusively related to power-on attacks, e.g. laser attacks carried out when the target circuit is powered on and running. Similarly, the corresponding countermeasures, either software or hardware, are also active: they only detect and react to an attack when powered on.

Objectives The objectives of this internship, **which will be adapted to the candidate**, are:

- to understand/simulate the effect of laser fault injection on hardware security primitives,
- to investigate techniques to detect that a power-off attack happened,
- to design hardware security primitives that are resistant to power-off attacks,
- to design hardware security primitives that can be tested on-line.

The internship could potentially be continued with a PhD.

2 Profile of a candidate

We are looking for a motivated candidate with skills in the following areas:

- micro-electronics,
- embedded systems,
- electronics design and simulation.

Knowledge, interest or previous experience in **hardware security** would be a plus.

3 Practical information

Location The internship will take place in one of these two research laboratories:

- LCIS (Laboratoire de Conception et d'Intégration des Systèmes), Valence, France
- TIMA (Techniques de l'Informatique et de la Microélectronique pour l'Architecture des systèmes intégrés), Grenoble, France

The candidate can **choose the location that best suits them**.

Stipend Around 600€/month

Starting date February/March 2022

Duration 5-6 months

4 How to apply?

To apply for this internship, please send a **CV and a cover letter** to:

- ✉ vincent.beroulle@esisar.grenoble-inp.fr
- ✉ brice.colombier@grenoble-inp.fr
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