

Seminar

Hybrid Memristor-CMOS PUFs – Worth the Effort?

Physical Unclonable Functions offer a way to convert uncontrollable hardware manufacturing variations into digital secrets. The most-researched PUF designs are based on typical CMOS manufacturing processes and thus inherit their inexpensiveness.

With memristors slowly becoming a more concretely available technology, PUFs based on memristor memory structures have been proposed. However, also hybrid designs have been proposed, often combining classical CMOS PUF structures with incremental improvements through added memristors (e.g. [1]), which sometimes can also be used for additional functionality (e.g. [2, 3]).

The aim of this work is a comprehensive literature search

- summarising hybrid memristor-CMOS PUF designs,
- determining the benefits and drawbacks compared to purely CMOS PUF designs, and
- evaluating whether the benefits can be worth the manufacturing overhead of combining multiple processes.

[1] <https://dl.acm.org/doi/10.1145/2736285>

[2] <https://ieeexplore.ieee.org/document/9272678>

[3] <https://ieeexplore.ieee.org/document/9424347>

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Advisors

Jonas Ruchti