

Seminar

# Gate Design and Synthesis Approaches for In-Memory Computing

Memristors are an emerging technology and show promising performance for non-volatile memory applications. As memories will likely be the first widely commercially produced memristor-based devices, it is reasonable to research possibilities to use the underlying technologies and structures for other applications.

One particular such topic is in-memory computing, where the memory cells' memristors are used as active elements to carry out boolean operations on stored data. Because the principle of operation is quite different to standard CMOS gates, new gate design approaches are needed; restrictions regarding interconnections and the transport of logic values necessitate different concepts for logic synthesis as well.

The aim of this work is to

- convey understanding of the gate design possibilities using memristors as active elements (e.g. [1]),
- summarise the state of the art of logic synthesis using memristor-based gates/logic cells (e.g. [2]), and
- provide a short outlook regarding practical applications.

[1] <http://ieeexplore.ieee.org/document/7448841/>

[2] <http://ieeexplore.ieee.org/document/8091016/>

## Contact

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## Advisors

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