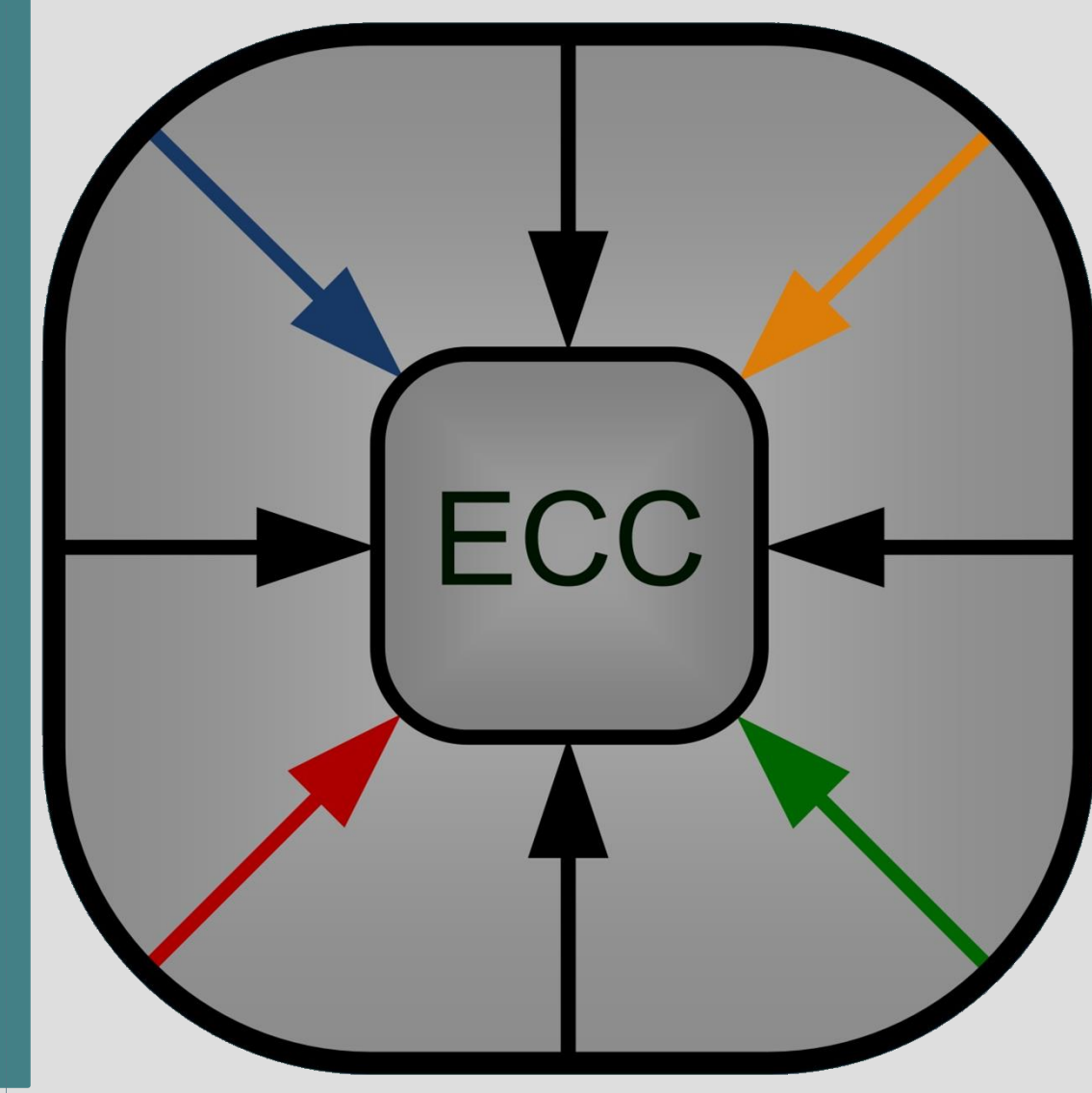




EMERGING CIRCUITS AND COMPUTATION GROUP (ECC)

ISTANBUL TECHNICAL UNIVERSITY
WWW.ECC.ITU.EDU.TR



Overview

- ECC group is operating in Computational Nanoelectronics Laboratory under the supervision of Dr. Mustafa Altun.
- Research areas of group are computing with switching nanoarrays, reliability of electronic boards, quantum circuits and stochastic computing and circuit design.
- Backgrounds of people are Electronics and Communication Engineering, Nanoscience and Nanoengineering, Control and Automation engineering etc.

Quantum Circuits

Circuit Design
Emerging Technologies
Computer Aided Design
Reliability
Nanoarrays
Stochastic Computing

ECC
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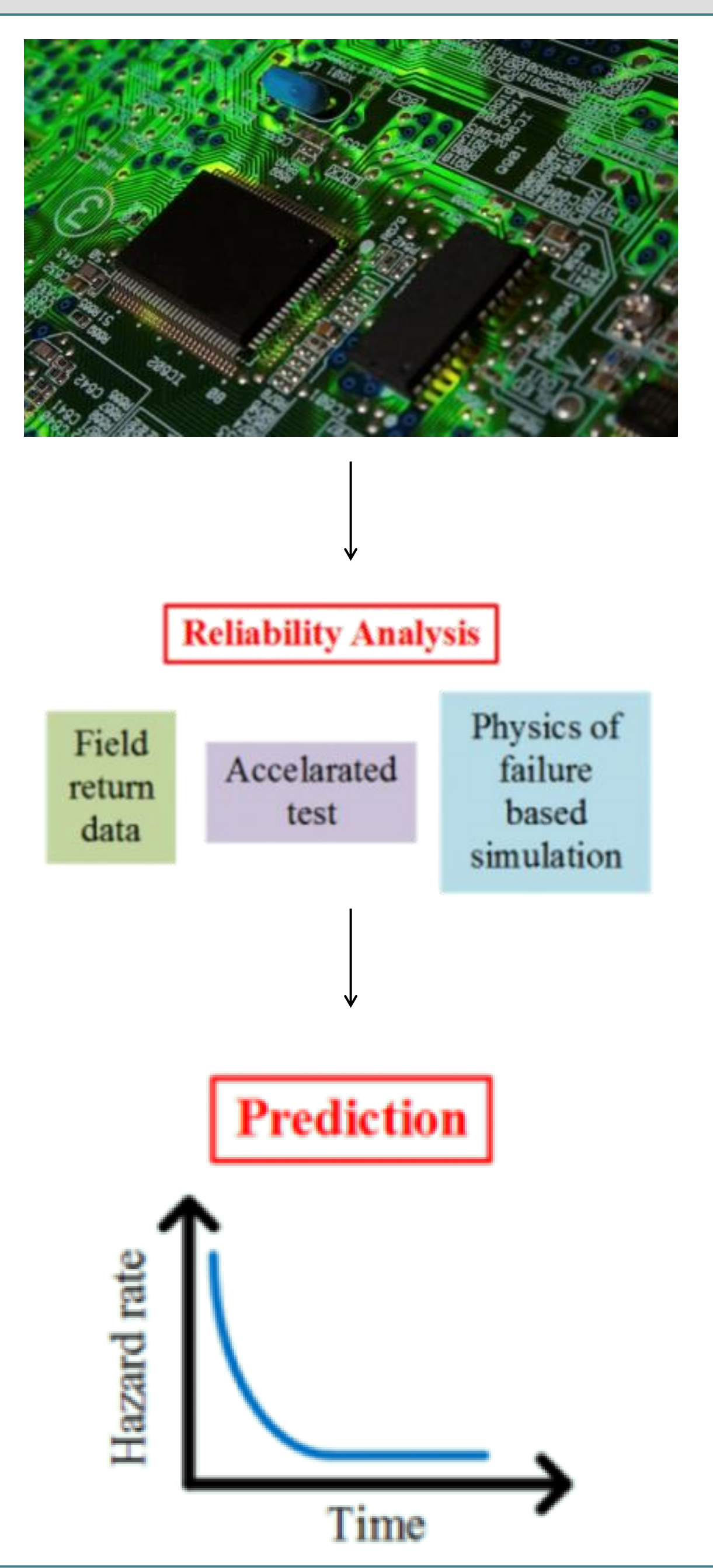
Current Projects

- Implementation of a Defect-Aware 8-Bit Reversible Microprocessor.
- Synthesis and Performance Optimization of a Switching Nano-Crossbar Computer (NanoXComp)
- Synthesis and Reliability Analysis of Nano Switching Arrays

Research Areas

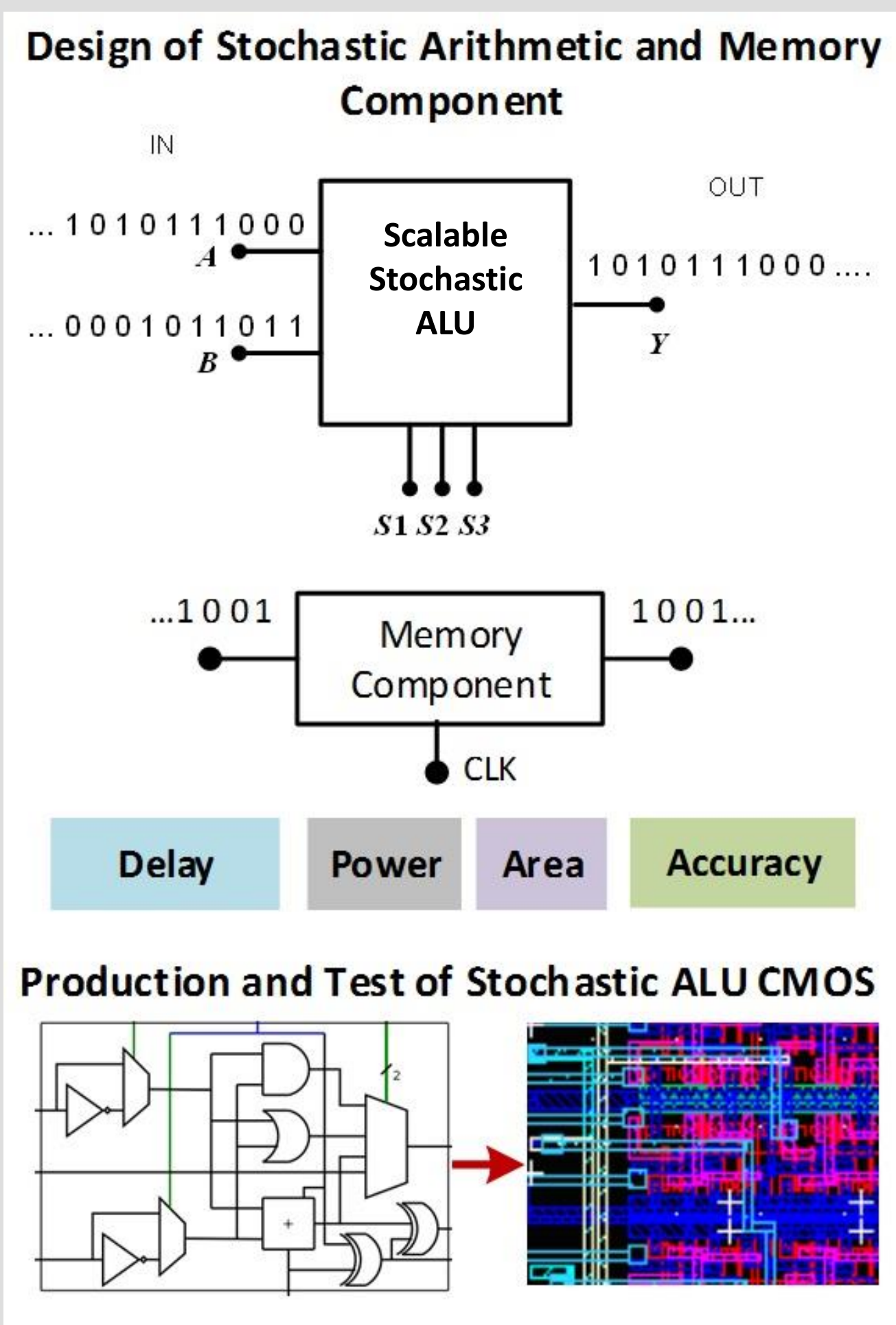
Reliability Analysis

- Developing less costly, yet accurate reliability analysis techniques.
- Using field return data, designing new accelerated tests.



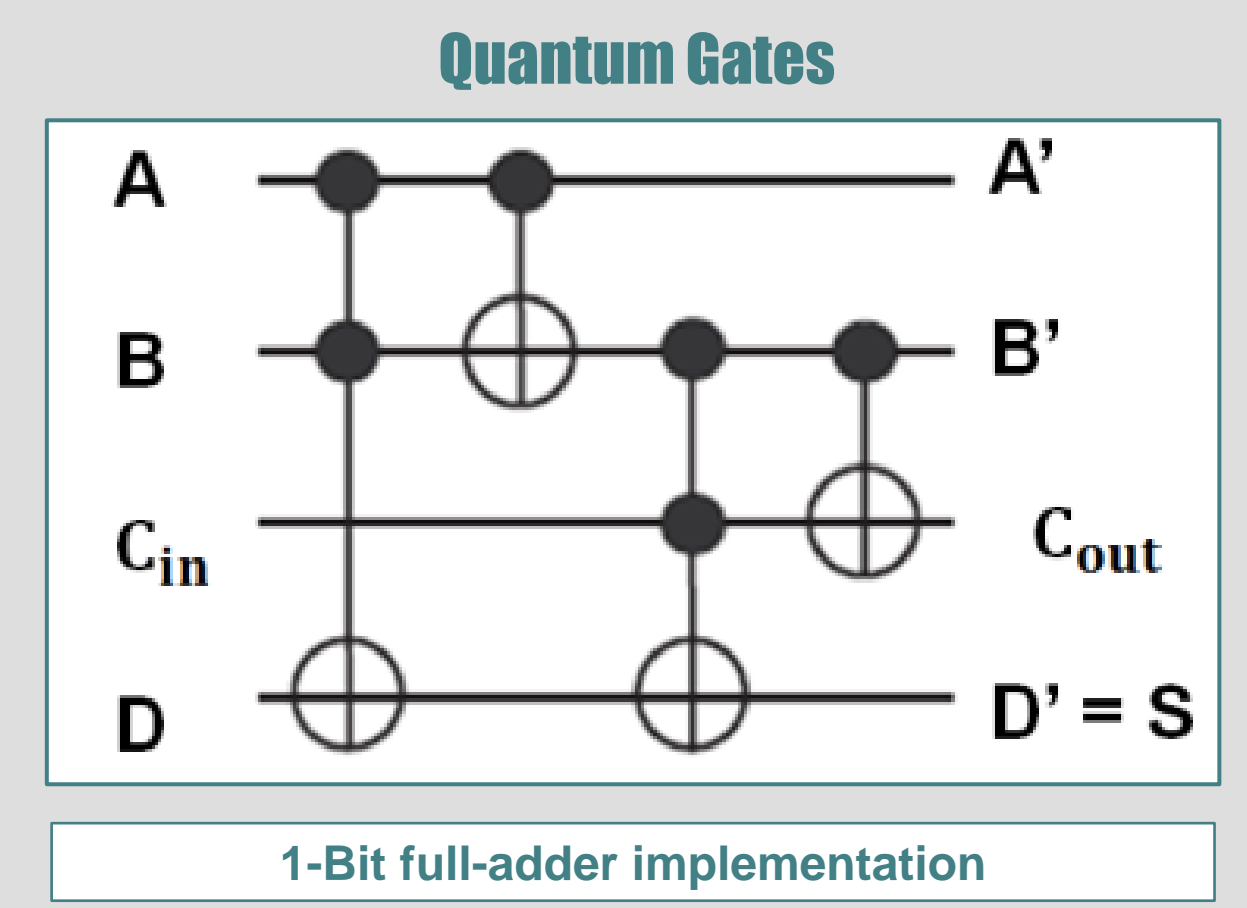
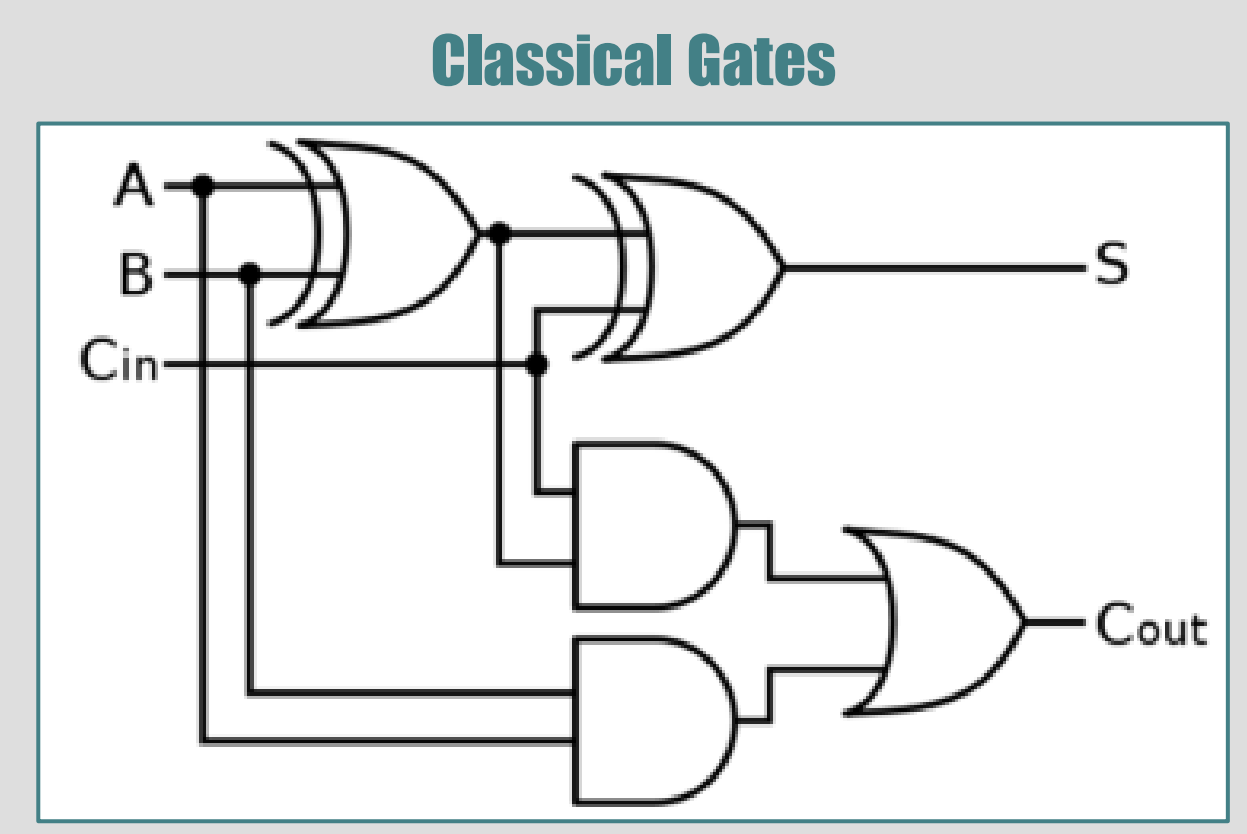
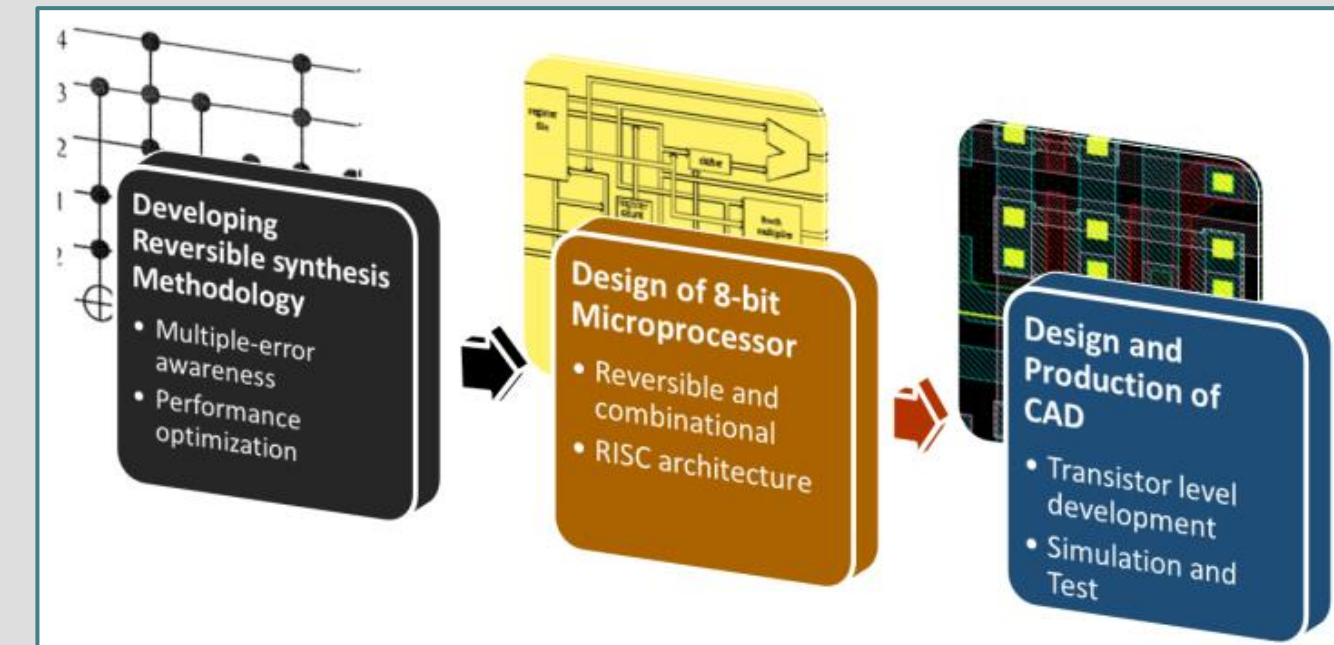
Stochastic Circuit Design

- Developing accurate arithmetic operation (addition and multiplication) with scalable stochastic circuit.
- Designing memory components
- Constructing a fully stochastic microprocessor.



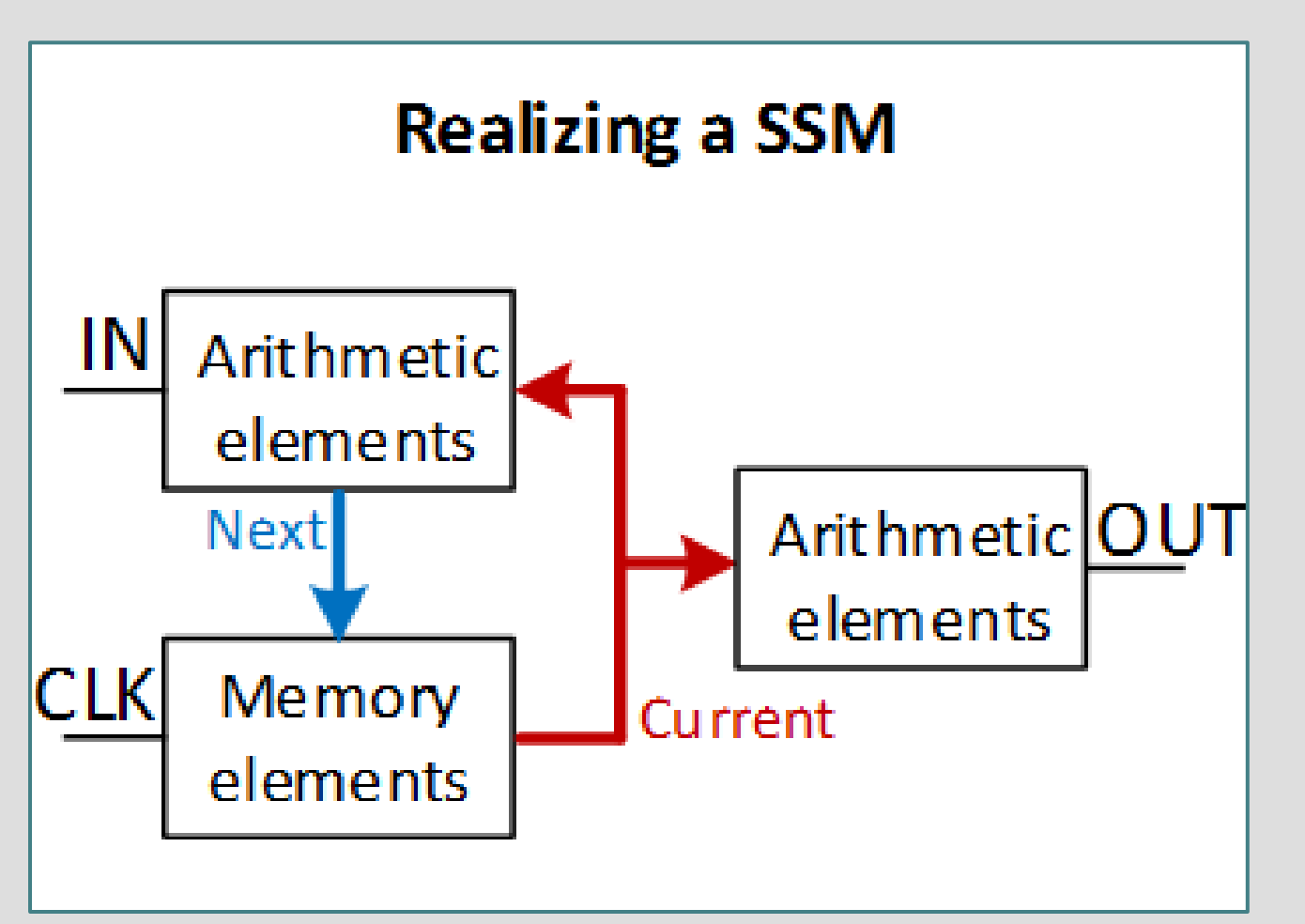
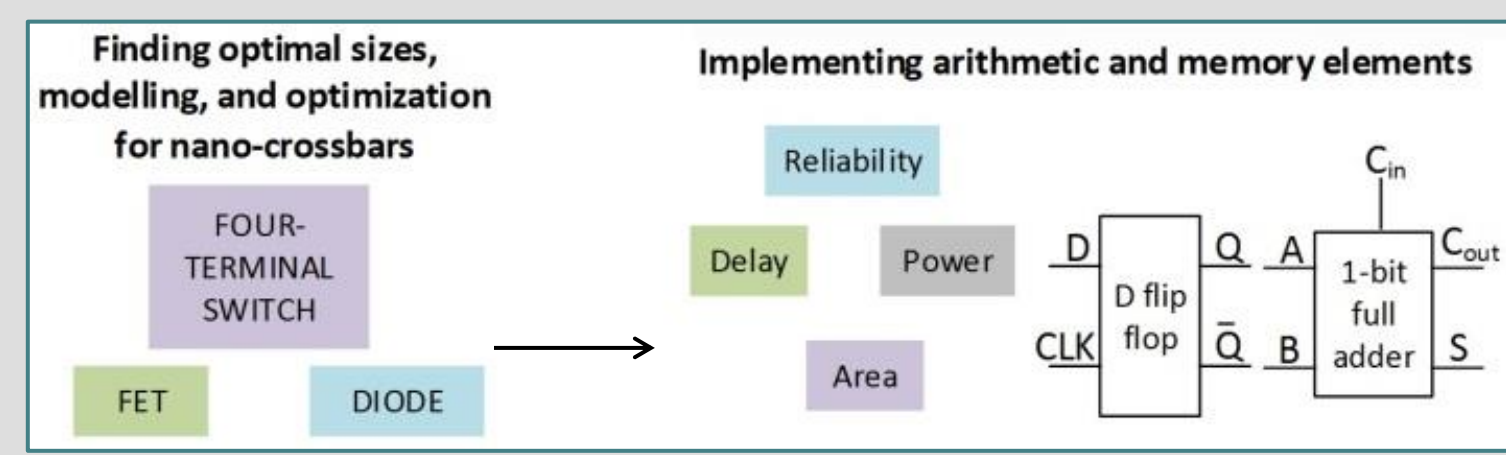
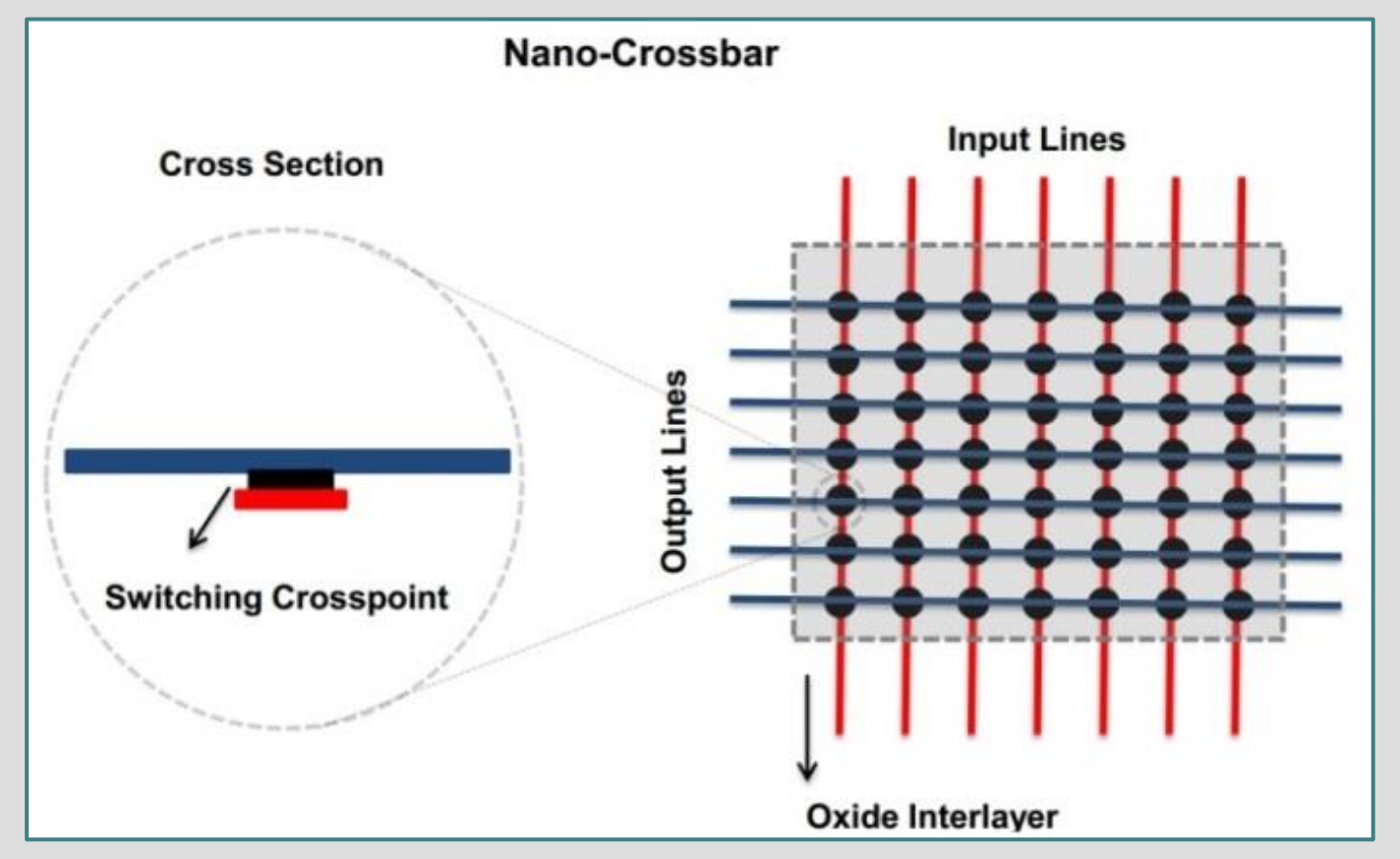
Reversible Computing

- Designing a reversible synthesis methodology with multiple error awareness
- Developing an 8-bit microprocessor with RISC architecture, reversible and combinational logic
- Design and production of CAD for reversible computing.



Computing with Switching Nanoarray

- Realizing an Synchronised State Machine (SSM) with switching nanoarrays
- Being a foundational methodology for future computing devices replacing CMOS.



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Online Source

