

Enhancing Dependability of Cyber-Physical Systems

M.Sc. Student Assignment

Introduction

Aging of nano-meter CMOS circuits is a bottleneck in designing systems for safety critical applications such as automotive (ADAS), space etc. To mitigate this problem our group is actively involved in designing digital and mixed-signal performance and reliability monitors integrated as IJTAG (IEEE 1687¹) compatible embedded instruments to predict the life-time of the SoC. The embedded instruments have constraints such as small footprint, non-interference with the typical operation, low-power etc. During the course of the assignment the student will have opportunity to work on various aspects of embedded systems design such as digital design, analog/mixed signal design and electronic measurement. One of the recent projects of the group is *IMMORTAL*².

Assignment

The goal of this thesis would be

- Evaluate and improve upon existing embedded instruments designed by the group.
- Analysis of reliability of standard IP's through modelling and simulations.

Profile

The student with one or more of the below skills would be a good match for the assignment.

- Digital design, FPGA and Verilog/VHDL.
- Understanding of the digital ASIC flow.
- Cadence spectre spice simulations.
- Electronic measurement.

The student would be working closely with a postdoc in the group.

References

[1] *IEEE Standard for Access and Control of Instrumentation Embedded within a Semiconductor Device,* in *IEEE Std 1687-2014*, vol., no., pp.1-283, Dec. 5 2014.

[2] <http://www.h2020-immortal.eu/>

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