

Secondment report

Name: ESR2.1 Aleksa DAMLJANOVIC
IRP title: Effective techniques for secure and reliable system validation
From: PDT
To: TUT
Period: 10th October – 25th October 2018

Activities during the secondment

▪ **Scope and objectives.**

The increasing number of embedded instruments used to perform test, monitoring, calibration and debug within a semiconductor device has called for a brand new standard---the IEEE 1687. Such a standard resorts to a reconfigurable scan network to provide efficient and flexible access to instruments and to handle complex structures. As it has to deliver reliable service, many approaches, both formal and simulation-based, have been proposed in the literature to perform test, diagnosis and verification of such networks. The problem we addressed is the post-silicon validation of a network [1]. As correct operation of IJTAG infrastructure is a product of many aspects and components, checking for any inconsistency between ICL descriptions (design) and hardware implementation is a necessity.

Activities.

We analyzed the mismatches between the specification and its silicon implementation, and we proposed a methodology to detect a subset of them by applying functional patterns and observing the length of the active scan path.

▪ **Main results achieved.**

Paper was written describing the analysis and the algorithm for generating validation routines. Experimental results on ITC2016 benchmarks demonstrate that the proposed approach is broadly applicable, and able to generate very effective sequences. We also classified mismatches that cannot be targeted relying exclusively on the active scan path length information. The paper was published and presented at the 24th IEEE European Test Symposium, May 27-31, Baden-Baden, Germany

▪ **Next steps.**

Extending the analysis and providing techniques for detecting currently undistinguishable mismatches. These should be targeted by PDL tests that take into account functionality and not only structure of the network.

Self-evaluation

Overall score: 4

I consider this secondment successful, with regards to the research objectives achieved, skills developed, supervision quality, diversity of the resources. (Agree = 5 ... Disagree = 1)

Optional comments: (text)

[1] "Report on structural analysis, verification and optimization methodology for ICL networks," in EU FP7 BASTION project report, 02 2016, pp. 1–42. [Online]. Available: <https://cordis.europa.eu/docs/projects/cnect/1/619871/080/deliverables/001-BASTIOND23v204.pdf>

