

## Secondment report

**Name:** ESR1.4 Josie Esteban RODRIGUEZ CONDIA  
**IRP title:** New techniques for on-line fault detection  
**From:** PDT  
**To:** CDNS  
**Period:** February 24 – May 5, 2020

### Activities during the secondment

#### ▪ **Scope and objectives.**

The research collaborations between PDT and CDNS started a few years ago and some results were obtained and disseminated. The main objective is to continue the research collaborations targeting other aspects.

- Discussions and continue the collaboration with ESRs 4.1 Felipe Augusto da Silva (CDNS) and 4.2 Ahmet Cagri Bagbaba (CDNS).
- Training on the tools and frameworks designed by CDNS to perform fault simulation campaigns, functional verification and synthesis of digital circuits.

#### ▪ **Activities.**

The activities were divided into two: research collaboration and training.

- Regarding research collaboration, the activities focused on determining the fault coverage of a representative model of a GPGPU, when using software-based self-test programs. These programs are used to functionally test the internal modules of the GPGPU. The target is to obtain the main figures and metrics using the expertise of ESR 4.2 on fault simulation campaigns. Moreover, the knowledge of ESR 4.1 can be applied on determining potential safe-faults in the structures of the GPGPU and reduce the simulation effort.
- The training activities were focused on following the tutorials provided by CDNS on the tools and frameworks used for simulation, fault simulation, functional verification and synthesis of digital circuits.

#### ▪ **Main results achieved.**

- The research collaboration produced a first overview of the effect of SBST programs to test the GPGPU modules. This overview suggested some additional task to be performed in order to obtain the expected relevant results.
- The tutorial and training on Xcelium Parallel Simulator, IMC and Genus were helpful and productive for the collaboration activities. Moreover, other on-going research activities were benefited of the developed skills.

#### ▪ **Next steps.**

- Continue the missing experiments in order to complete the overview of the SBST effectiveness in GPGPUs.
- Write a manuscript with the relevant results of the collaborative work and start the submission of the manuscript to a recognized journal in the field.

#### ▪ **Optional request for support or a technology/tool available at host:**

NA

### 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:** The pandemic by COVID-19 partially changed the priority and the development of some activities initially targeted.

*Date of the report approval by the supervisor:*

