**Review**

**Gaspar Karm**

**„Pyha - Object-Oriented Hardware Description Language Based On Python“**

The Master Thesis of Gaspar Karm is about development of Python based object oriented HDL “PYHA” and corresponding development and pre-synthesis approach for designing DSP related digital systems. The language and approach (tool?) are aimed to be distributable as a public domain product. The Python-close design approach is justified due to high abstraction level and increasing popularity (supported by advanced and stable compilers) of Python as a high-level modelling tool.

The thesis is well structured and written (single typing mistakes), references adequate and referencing of earlier work correctly performed. What is missing is a general picture of design path showing position, role and design information paths of Pyha in ensemble with other design tools and environments. Also, there could be comparison between Pyha and other design inputs (MyHDL, MATLAB, C, SV, …) in terms of synthesis time and synthesized HW quality (speed, resources). The provided comparison covers rather arbitrary set of features in textual form.

Questions:

1. The meaning of PYHA ? Is it an acronym?
2. What exactly is OOP VHDL model (mentioned the first on page 6)? Is the OOP-style VHDL thesis author’s contribution? The attempts to enhance OO features of VHDL has been done already 20 years ago.
3. There are verification through simulation and different formal verification methods. Where is positioned Pyha in respect of those verification methods?
4. What is ‘boilerplate code’? (Pg. 7)
5. In Figure 2.4. (Pg. 9), Figure 2.9 (Pg. 15) are four elements in Legend, but only two values are visible.
6. How is Pyha related to MyHDL (which is Python based HDL)?
7. How to makes Pyha applicable designing GALS (Globally Asynchronous, Locally Synchronous) systems?
8. The Pyha is aimed for public domain – where can it be found?
   1. Is there user guide of Pyha?
   2. What plans has author disseminating the Pyha in HW designers community?

In conclusion, the Master work of Gaspar Karm is adding valuable contribution to DSP-design oriented digital hardware design community. The amount of work is appreciable; only presenting the results has some improvement space. The reviewer’s proposal is to assess Gaspar Karm Master work with a grade “very good” (4).

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