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DSI Aerospace Technologie GmbH • Otto-Lilienthal-Str. 1
D-28199 Bremen • Germany
Phone +49 421 59696-951
Fax +49 421 59696-959
<http://www.dsi-as.de>

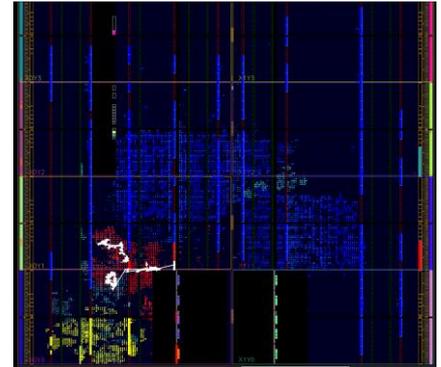
Bachelor / Project Thesis

Tool for Rough Estimation of FPGA Resource Utilization

Motivation:

DSI is mostly developing electronics for space applications. Whenever we receive new invitations to tender for new missions, we have to start working on basic designs to fulfil the requested requirements. Central components of the designs are FPGAs as they offer high flexibility and computational performance. Giving a set of requirements we have to estimate which features could be implemented within a single FPGA and how interfaces, storage capacities, data rates etc. would scale.

Of course, this is part of our daily work and we gained extensive competence for this task. However, it would be highly beneficial to support this process with a tool that offers a convenient user interface. Providing a set of requirements, a tool could roughly estimate the utilization of FPGAs to support the design of a basic architecture.



Work description:

You will start with a comprehensive research study to gather information on existing approach how the utilization of FPGA resources can be estimated. We already have tools to generate resource consumption of IP cores that should further be integrated. The output files of this tool could be used together with other information to allow a rough assembly of a system design. Without any time consuming synthesis or actual FPGA design, the tool should generate information on resource demands based on user input requirements. As mentioned above, the tool should provide a user interface (GUI) and options to extend new features (e.g. updated IP cores, new FPGAs, etc.). A short case study should show the accuracy of the estimation, thus an evaluation is also an essential part of the thesis.

Prerequisites:

For successful thesis completion, you should fulfill the following requirements:

- Moderate background in FPGAs, SoC, programmable logic
- Programming skills to build an estimation tool (preferred programming language optional, integration of ext. tools)
- The willingness for hands-on implementation as well as theoretical considerations and analyzes

Contact:

Dr. Ulf Kulau

DSI Aerospace Technologie GmbH

Phone: +49 421 596969 31

ulf.kulau@dsi-as.de