

AMIQ Consulting Wins Third Place Stuart Sutherland Best Paper Award at DVCon U.S.

Novel Approach Validated with Leading FPGA Platform

SAN JOSE, CALIFORNIA, UNITED STATES, March 16, 2021 /EINPresswire.com/ -- [AMIQ Consulting](#), provider of ASIC verification services and verification training classes, today announced that “Open-Source Framework for Co-Emulation Using PYNQ” has received the Stuart Sutherland Best Paper third place award at the Design and Verification Conference (DVCon) U.S. Ioana Catalina Cristea and Dragos Dospinescu of AMIQ Consulting co-authored the paper and presented the results at the virtual conference.

The paper and talk discussed a recent innovative project using co-emulation, in which parts of a Universal Verification Methodology (UVM) testbench are mapped into an FPGA along with the design being verified. This accelerates receiving and processing stimulus by the design due to the parallelism in the FPGA hardware system. In the AMIQ Consulting approach, portions of the testbench drivers and monitors are created in synthesizable form so that they can be placed into the FPGA.

The team developed the Open-source Framework for Co-emulation (OFC), which connects the UVM testbench to a processor acting as the FPGA controller, and the controller to the FPGA logic. The OFC provides one component for each of these connections, both written using the Python scripting language. The OFC framework was tested on the PYNQ hardware platform and application programming interface (API) from Xilinx. The OFC can also be used with other FPGA platforms and software.

Co-emulation provides more acceleration than co-simulation, in which only the design is mapped into the FPGA logic. The resulting speed-up depends on several factors, including the amount of logic translated into the hardware platform (more is better), the amount of direct memory access (DMA) (less is better), and the number of context switches (as few as possible). The OFC requires little integration effort, can be easily updated, and is open-source and tool agnostic.

“This was an interesting project that clearly showed the advantages of using co-emulation rather than traditional co-simulation,” said Ioana Catalina Cristea, Verification Engineer at AMIQ Consulting. “We have made the source code available and provided guidance so that others can adopt this approach with minimal effort.”

“We are looking forward to trying more designs and testbenches, and in hearing from other users about their experiences,” said Dragos Dospinescu, Senior Verification Engineer at AMIQ Consulting. “We would like to thank DVCon and its attendees for this nice recognition of our work.”

Availability

The OFC code is provided as an open-source library under Apache License 2.0, downloadable at https://github.com/amiq-consulting/amiq_ofc. For more information:

- Summary blog post: <https://www.amiq.com/consulting/2021/03/05/ofc-open-source-framework-for-co-emulation-using-pynq/>
- Complete DVCon paper: https://www.amiq.com/consulting/wp-content/themes/Amiq-Unify/papers/ofc_dvconus2021/OFC-Paper.pdf
- Recorded DVCon presentation: https://www.amiq.com/consulting/wp-content/themes/Amiq-Unify/papers/ofc_dvconus2021/OFC-Recording.mp4

About AMIQ Consulting

AMIQ Consulting combines a deep knowledge of hardware design verification domain, languages, methodologies, and tools with extensive project experience to help companies deliver complex ASIC and FPGA designs on time and within budget and infrastructure constraints. Consulting services range from functional and system-level verification to training and outsourcing. Established in 2003, the company has built up a solid base of expertise in pre-silicon hardware verification and a strong reputation among clients in the automotive, telecommunications, and computers and peripherals industries. AMIQ Consulting: Expert Verification Services. High quality. Cost effective. On time.

For more information about AMIQ Consulting and its solutions, visit www.amiq.com/consulting/.

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