



11th FPGAworld CONFERENCE

SEPTEMBER 9th, 2014, STOCKHOLM
SEPTEMBER 11th, 2014, COPENHAGEN

EDITORS

Lennart Lindh, Johnny Öberg, Vincent J. Mooney III, Timo D. Hämmäläinen, David Källberg, Peeter Ellervee and Santiago de Pablo

ACADEMIC PROCEEDINGS 2014

The FPGAworld Conference addresses all aspects of digital and hardware/software system engineering on FPGA technology. It is a discussion and network forum for researchers and engineers working on industrial and research projects, state-of-the-art investigations, development and applications. The proceedings contain the academic presentations, a separate report contains also the industrial presentations; for more information see (www.fpgaworld.com/conference).

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General Academic Chairman's Message

The FPGAWorld program committee welcomes you to the 11th FPGAWorld conference. This year, the conference is divided in two places, Copenhagen (Denmark) and Stockholm (Sweden). Earlier FPGAWorld has been organized in Finland (Tampere), India (Udaipur), Germany (Munich) and Sweden (Lund).

FPGAWorld conference has academic reviewed papers, together with light reviewed industrial papers, key notes and product presentations, which make a very good mix of presentations. FPGAWorld has also on both locations exhibitors and sometimes tutorials. This is covering a raise in demand from the academic and industries of FPGA knowledge.

Please check out the website (<http://www.fpgaworld.com>) for more information about FPGAWorld 2014. In addition, you may contact David or Mia (david@fpgaworld.com, mia@fpgaworld.com) for more information about product presentations, web advertisements, sponsoring, tutorials and exhibits. For academic and industrial presentations, please see the FPGAWorld website for more information.

FPGAWorld already now opens to receive suggestions for next year's conference in September 2015. We are interested in key notes, web advertisements (year around), sponsoring, technical papers, product presentations, student projects, exhibits and tutorials. Submissions are open to students, academics and industrial professionals. Together we can make the FPGAWorld conference exceed above our best expectations!

FPGAWorld likes to thank for all contributions and hope that attendees will enjoy the FPGAWorld conference.

Johnny Öberg
johnnyob@kth.se
General Academic Chair

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Ove Boström, FPGAworld

08:30	FPGAworld 2014 Registration; Stockholm, Sep 9th, Frösundaleden 2A, 169 70 Solna, SWEDEN. www.FPGAworld.com		
09:00	Conference Opening Thony Johansson, ÅF and Lennart Lindh, FPGAworld Room: Renen		
09:15 – 10:00	Key Note Session Field Programmable SoCs: The Greatest Acceleration of the Innovation Race Key Note Speakers: Hichem Belhadj , Microsemi Corp, USA Hichem Belhadj has been involved in the Programmable Logic Industry since the late 80s. He has been with Microsemi SoC (former Actel) for over 15 years. Hichem has recently moved to Microsemi Corporate to lead the Field Systems and Applications Engineering. He holds a Master and a PhD from the Polytechnic Institute of Grenoble. Session Chair: Lennart Lindh, FPGAworld Room: Renen		
10:00	Coffee Break & Exhibition		
	Industrial and Student/Hackers Program Session Chair: Kim Petersén , HDC AB Room: Renen	Academic Program, B1-4 Session Chair: Jaan Raik , Tallinn University of Technology Room: Råven	Product Program Session Chair: Ove Boström , FPGAworld Room: Storken
10:30 – 12:30	A1: VUnit - An Automated Testing Framework for VHDL Lars Asplund, Synective Labs, Sweden. A2: SimXMD: Simulation-based HW/SW Co-Debugging for FPGA Embedded Systems Ruediger Willenberg, University of Toronto, Canada. A3: Achieving the right FPGA design quality – Could reviews save the day?	B1: Performance Evaluation of Dynamic Circuit Specialization on Xilinx FPGAs Dirk Stroobandt, Tom Davidson, Karel Heyse, Amit Kulkarni - ELIS department, Computer Systems Lab, Ghent University, Belgium. B2: Optimizing Memory Power in Hybrid ARM-FPGA Chips With Lossless Data Compression PengSun, Jose Nunez-Yanez, University of Bristol, England.	C1: Synopsys HAPS Developer eXpress FPGA-based Prototyping Solution Antti Innamaa, Synopsys, USA. C2: Digital Power System management for FPGAs Mats Hellberg, Linear Technology, USA. C3: Bridging the FPGA World and the PCB Rick Stroot, InnoFour, Netherlands.

	<p>Bitvis AS, Espen Tallaksen, Norway.</p> <p>A4: A CORDIC Processor Implemented on a DE2-115 Board, (15 min)</p> <p>Martin Sjödin, Ericsson and AGSTU School of Higher Vocational Education, Sweden, Sweden.</p> <p>A5; Working with Xilinx Zynq efficiently, (15 min)</p> <p>Jan Viktorin and Pavol Korcek, Brno University of Technology, Czech Republic.</p>	<p>B3: The Track Engine an FPGA Implementation of a Track-finding Algorithm for the IceCube Neutrino Telescope Carl Wernhoff,</p> <p>B4: Going for Brain-Scale Integration using FPGAs, TSVs and NOC based Artificial Neural Networks: A Case Study Nowshad Painsa Mand, Johnny Öberg - KTH Royal Institute of Technology, Sweden.</p>	<p>C4: Silicon and Software for Easy 20nm Designs</p> <p>Jonas Åström, Altera.</p>
12:30	Lunch Break & Exhibition		
	<p>Industrial program</p> <p>Session Chair: Johnny Öberg, KTH, Sweden</p> <p>Room: Renen</p>	<p>Industrial and product program</p> <p>Session Chair:</p> <p>Room: Råven</p>	<p>Product Program</p> <p>Session Chair:</p> <p>Ove Boström, FPGAworld</p> <p>Room: Storcken</p>
13:30 - 15:00	<p>A6: The Gates are Open: An overview of the OpenRISC Ecosystem</p> <p>Olof Kindgren, Qamcom Research & Technology.</p> <p>A7: Bufferless Video Encoding for Biomedical Applications on sub-one-dollar FPGA Devices</p> <p>Mario Vigliar, DPControl Srl - I3C srl - University of Salerno, Italy.</p>	<p>A9: Use of FPGAs in Cryptocurrencies, (1 hour)</p> <p>Mike Dini, Dini Group, USA.</p> <p>Product Program, C8</p> <p>C8: Spacetime: High performance design made easy, Tabula.</p>	<p>C5: Introducing the world's only high density FPGA built using Intel's 22nm FinFet technology</p> <p>Les MacInnes, Achronix.</p> <p>C6: UVVM: Universal VHDL Verification Methodology ("UVM for VHDL")</p> <p>Bitvis AS, Espen Tallaksen, Norway.</p>

	<p>A8 : Hardware Automation of Scheduler, Placer, Inter-Task Communications and IO System Functions for Manycore Processors Dynamically Shared among Multiple Applications</p> <p>Mark Sandstrom, ThroughPuter, Inc, USA.</p>		<p>C7: FPGA Best Practices - A pragmatic approach to faster and better development</p> <p>Bitvis AS, Espen Tallaksen, Norway.</p>
15:00	<p>Coffee Break & Exhibition Sponsored by AGSTU AB</p>		
15:30 - 16:30	<p>Panel Discussion</p> <p>FPGAs - 10 years from now</p> <p>Session Moderator: Per Henricsson, Elektroniktidningen (Swedish Magazine)</p> <p>Panel:</p> <p>Jaan Raik, Tallinn</p> <p>Mike Dini, Dini Group, USA</p> <p>Room: Renen</p>		
16:30	<p>Go Home Drink in the Exhibition hall Sponsored by FPGAworld</p> <p>Sponsors FPGAworld 2014:</p> 		

08:30	<p>OBS one presentation is default 25 minutes (20 minutes presentation and 5 minutes questions)</p> <p align="center">FPGAworld 2014</p> <p align="center">Registration Sep 11th DTU (SCION), Building 372, Diplomvej 2800 Lyngby</p> <p align="center">www.FPGAworld.com</p>	
09:00	<p align="center">Conference opening</p> <p align="center">Lennart Lindh, FPGAworld and Lars Dittmann, Technical University of Denmark</p>	
09:15	<p align="center">Key Note Session</p> <p align="center">Field Programmable SoCs: The Greatest Acceleration of the Innovation Race</p> <p align="center">Key Note Speakers: Hichem Belhadj, Microsemi Corp, USA</p> <p align="center">Hichem Belhadj has been involved in the Programmable Logic Industry since the late 80s. He has been with Microsemi SoC (former Actel) for over 15 years. Hichem has recently moved to Microsemi Corporate to lead the Field Systems and Applications Engineering. He holds a Master and a PhD from the Polytechnic Institute of Grenoble.</p> <p align="center">Session Chair: Lars Dittmann, Technical University of Denmark</p>	
10:00	<p align="center">Coffee&Tea Break</p> <p align="center">Sponsored by DTU, Technical University of Denmark</p>	
10:30 – 12:35	<p align="center">Product Program, C1-5</p> <p align="center">Session Chair: Ove Boström, FPGAworld</p> <p>C1: Synopsys HAPS Developer eXpress FPGA-based Prototyping Solution Antti Innamaa, Synopsys, USA.</p> <p>C2: Development of a 10G Ethernet UDT Server in FPGA Steinn Gustafsson, Chevin Technology, United Kingdom.</p>	

	<p>C3: Introducing the world's only high density FPGA built using Intel's 22nm FinFet technology</p> <p>Les MacInnes, Achronix.</p> <p>C4: Bridging the FPGA World and the PCB Rick Stroot, InnoFour, Netherlands.</p> <p>C5: Silicon and Software for Easy 20nm Designs Rune Domsten, Altera.</p>	
12:35	<p style="text-align: center;">Lunch Break & Exhibition</p> <p style="text-align: center;">Sponsored by DTU, Technical University of Denmark</p>	
13:30 – 15:00	<p style="text-align: center;">Industrial and Student/Hackers Program, A1-3 Session Chair:</p> <p>A1: Bufferless Video Encoding for Biomedical Applications on sub-one-dollar FPGA Devices</p> <p>Mario Vigliar, DPControl Srl - I3C srl - University of Salerno, Italy.</p> <p>A2: SimXMD: Simulation-based HW/SW Co-Debugging for FPGA Embedded Systems</p> <p>Ruediger Willenberg, University of Toronto, Canada.</p> <p>A3: The Gates are Open: An overview of the OpenRISC Ecosystem</p> <p>Olof Kindgren</p> <p>A4: Working with Xilinx Zynq efficiently, (15 min)</p> <p>Jan Viktorin and Pavol Korcek, Brno University of Technology, Czech Republic.</p>	
15:00	<p style="text-align: center;">Coffee Break</p> <p style="text-align: center;">Sponsored by DTU, Technical University of Denmark</p>	

Academic Program, B1-3

Session Chair: **Johnny Öberg**, KTH, Sweden

All abstracts

B1: A Multi-Paradigm Approach to Teaching Students Embedded Systems Design using FPGAs and CPLDs David C. Dyer - School of Engineering, University of Warwick, UK, Yan Lin Aung - CHiPES Research Centre, Nanyang Technological University, Singapore

15:15
–
16:55

B2: An FPGA-Like Ultra Low-Power Network-On-Chip for Multicore Embedded Systems
Meysam Zaeemi, Mehdi Modarressi – Department of Electrical and Computer Engineering,
College of Engineering, Univeristy of Tehran, Iran

B3: A Reconfigurable On-chip Network Architecture for the Dark Silicon Era
Mehdi Modarressi, Hamid Sarbazi-Azad – Department of Electrical and Computer Engineering,
College of Engineering, Univeristy of Tehran, Iran

Product Program, C6

Session Chair: Ove Boström, FPGAworld

C6: Spacetime: High performance design made easy **Tabula**

Panel Discussion

MPSoC on FPGAs

Session Moderator: **Rolf Sylvester-Hvid**, Aktuel Elektronik, (Danish Magazine)

17:00
–
about
17:30

Panel:

Johnny Öberg, KTH, Sweden

Jens Sparsö, DTU, Denmark

Martin Shoeberl, DTU, Denmark

Sponsors FPGAworld 2014:



1	Dirk Stroobandt; Tom Davidson; Karel Heyse; Amit Kulkarni	Performance Evaluation of Dynamic Circuit Specialization on Xilinx FPGAs
2	PengSun; Jose Nunez-Yanez	Optimizing Memory Power in Hybrid ARM-FPGA Chips With Lossless Data Compression
3	Nowshad Painsa Mand; Johnny Öberg	Going for Brain-Scale Integration using FPGAs, TSVs and NOC based Artificial Neural Networks: A Case Study
4	David C. Dyer; Yan Lin Aung	A Multi-Paradigm Approach to Teaching Students Embedded Systems Design using FPGAs and CPLDs
5	Meysam Zaeemi; Mehdi Modarressi	An FPGA-Like Ultra Low-Power Network-On-Chip for Multicore Embedded Systems
6	Mehdi Modarressi; Hamid Sarbazi-Azad	A Reconfigurable On-chip Network Architecture for the Dark Silicon Era