

2011 22nd IEEE International Symposium on Rapid System Prototyping

(RSP 2011)

**Karlsruhe, Germany
24 – 27 May 2011**



**IEEE Catalog Number: CFP11047-PRT
ISBN: 978-1-4577-0658-5**

Table of Contents

Message from the General Chair	iii
Message from the Program Chairs	iv
Message from the Organizing Chairs	v
Conference Committees	vi
Tutorial and Keynotes	vii

Session 1: Automotive & FPGA

Chair - Kenneth Kent, University of New Brunswick, Canada

An FPGA-Based Signal Processing System for a 77 GHz MEMS Tri-Mode Automotive Radar	2
<i>Sazzadur Chowdhury, Roberto Muscedere and Sundeep Lal</i>	
FPGA based Real-Time Object Detection Approach with Validation of Precision and Performance	9
<i>Alexander Bochem, Kenneth Kent and Rainer Herpers</i>	
Rapid Prototyping of OpenCV Image Processing Applications using ASP	16
<i>Felix Mühlbauer, Michael Großhans and Christophe Bobda</i>	
Optimization Issues in Mapping AUTOSAR Components To Distributed Multithreaded Implementations	23
<i>Ming Zhang and Zonghua Gu</i>	
FPGA Design for Monitoring CANbus Traffic in a Prosthetic Limb Sensor Network.....	30
<i>Alexander Bochem, Kenneth Kent, Yves Losier, Jeremy Williams and Justin Deschenes</i>	

Session 2: Prototyping Architectures

Chair - Martin Hillenbrand, Karlsruhe Institute of Technology, Germany

Rapid Single-Chip Secure Processor Prototyping on OpenSPARC FPGA Platform	38
<i>Jakub Szefer, Wei Zhang, Yu-Yuan Chen, David Champagne, King Chan, Will Li, Ray Cheung and Ruby Lee</i>	
A Study in Rapid Prototyping: Leveraging Software and Hardware Simulation Tools in the Bringup of System-on-a-Chip Based Platforms	45
<i>Owen Callanan, Antonino Castelfranco, Catherine Crawford, Eoin Creedon, Scott Lekuch, Kay Muller, Mark Nutter, Hartmut Penner, Brian Purcell, Mark Purcell and Jimi Xenidis</i>	
Rapid automotive bus system synthesis based on communication requirements	53
<i>Matthias Heinz, Martin Hillenbrand, Kai Klindworth and Klaus D. Müller-Glaser</i>	
An event-driven FIR filter: design and implementation	59
<i>Taha Beyrouthy and Laurent Fesquet</i>	

Session 3: Prototyping Radio Devices

Chair - Matthias Heinz, Karlsruhe Institute of Technology, Germany

Applying Graphics Processor Acceleration in a Software Defined Radio Prototyping Environment.....	67
<i>William Plishker, George Zaki, Shuvra Bhattacharyya, Charles Clancy and John Kuykendall</i>	
Validation of Channel Decoding ASIPs A Case Study.....	74
<i>Christian Brehm and Norbert Wehn</i>	
Area and Throughput Optimized ASIP for Multi-Standard Turbo decoding	79
<i>Rachid Alkhayat, Purushotham Murugappa, Amer Baghdadi and Michel Jezequel</i>	
Design of an Autonomous Platform for Distributed Sensing-Actuating Systems.....	85
<i>François Philipp, Faizal A. Samman and Manfred Glesner</i>	

Session 4: Virtual Prototyping for MPSoC

Chair - Frédéric Rousseau, Université Joseph Fourier, France

A Novel Low-Overhead Flexible Instrumentation Framework for Virtual Platforms	92
<i>Tennessee Carmel-Veilleux, Jean-François Boland and Guy Bois</i>	
Using Multiple Abstraction Levels to Speedup an MPSoC Virtual Platform Simulator	99
<i>João Moreira, Felipe Klein, Alexandro Baldassin, Paulo Centoducatte, Rodolfo Azevedo and Sandro Rigo</i>	
A non intrusive simulation-based trace system to analyse Multiprocessor Systems-on-Chip software	106
<i>Damien Hedde and Frédéric Pétrot</i>	
Embedded Virtualization for the Next Generation of Cluster-based MPSoCs	113
<i>Alexandra Aguiar, Felipe Gohring De Magalhaes and Fabiano Hessel</i>	

Session 5: Model Based System Design

Chair - Frédéric Pétrot, Grenoble-INP, France

Rapid Property Specification and Checking for Model-Based Formalisms	121
<i>Daniel Balasubramanian, Gabor Pap, Harmon Nine, Gabor Karsai, Michael Lowry, Corina Pasareanu and Tom Pressburger</i>	
Automatic Generation of System-Level Virtual Prototypes from Streaming Application Models	128
<i>Philipp Kutzer, Jens Gladigau, Christian Haubelt and Jürgen Teich</i>	
An Automated Approach to SystemC/Simulink Co-Simulation	135
<i>Francisco Mendoza, Christian Koellner, Juergen Becker and Klaus D. Müller-Glaser</i>	
Extension of Component-Based Models for Control and Monitoring of Embedded Systems at Runtime	142
<i>Tobias Schwalb and Klaus D. Müller-Glaser</i>	
A model-driven based framework for rapid parallel SoC FPGA prototyping	149
<i>Mouna Baklouti, Manel Ammar, Philippe Marquet, Mohamed Abid and Jean-Luc Dekeyser</i>	
A State-Based Modeling Approach for Fast Performance Evaluation of Embedded System Architectures	156
<i>Sebastien Le Nours, Anthony Barreteau and Olivier Pasquier</i>	

Session 6: Software for Embedded Devices

Chair - Scott Lekuch, IBM Corporation, USA

Task Mapping on NoC-Based MPSoCs with Faulty Tiles: Evaluating the Energy Consumption and the Application Execution Time	164
<i>Alexandre Amory, César Marcon, Fernando Moraes and Marcelo Lubaszewski</i>	
Me3D: A Model-driven Methodology Expediting Embedded Device Driver Development	171
<i>Hui Chen, Guillaume Godet-Bar, Frédéric Rousseau and Frédéric Pétrot</i>	

Session 7: Tools and Designs for Configurable Architectures

Chair - Sazzadur Chowdhury, University of Windsor, Canada

Schedulers-Driven Approach for Dynamic Placement/Scheduling of multiple DAGs onto SoPCs	179
<i>Ikbel Belaid, Fabrice Muller and Maher Benjema</i>	
Generation of emulation platforms for NoC exploration on FPGA	186
<i>Junyan Tan, Virginie Fresse and Frédéric Rousseau</i>	
Arbitration and Routing Impact on NoC Design	193
<i>Edson Moreno, Cesar Marcon, Ney Calazans and Fernando Moraes</i>	
On-Chip Efficient Round-Robin Scheduler for High-Speed Interconnection	199
<i>Surapong Pongyupinpanich and Manfred Glesner</i>	
Author Index	203