PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 8067

, "Front Matter: Volume 8067," Proc. SPIE 8067, VLSI Circuits and Systems V, 806701 (23 May 2011); doi: 10.1117/12.899483

SPIE.

Event: SPIE Microtechnologies, 2011, Prague, Czech Republic

PROCEEDINGS OF SPIE

VLSI Circuits and Systems V

Teresa Riesgo
Eduardo de la Torre-Arnanz
Editors

18–20 April 2011
Prague, Czech Republic

Sponsored and Published by
SPIE

Volume 8067

Proceedings of SPIE, 0277-786X, v. 8067

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *VLSI Circuits and Systems V*, edited by Teresa Riesgo, Eduardo de la Torre-Armanz, Proceedings of SPIE Vol. 8067 (SPIE, Bellingham, WA, 2011) Article CID Number.

ISSN 0277-786X

ISBN 9780819486561

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2011, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/11/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

vii *Conference Committee*

SESSION 1 BIO-INSPIRED AND RECONFIGURABLE SYSTEMS

- 8067 02 **Evolutionary hardware design (Invited Paper)** [8067-01]
L. Sekanina, Brno Univ. of Technology (Czech Republic)
- 8067 03 **3D-design exploration of CNN algorithms** [8067-02]
L. Spaanenburger, S. Malki, Lund Univ. (Sweden)
- 8067 04 **Bio-inspired FPGA architecture for self-calibration of an image compression core based on wavelet transforms in embedded systems** [8067-03]
R. Salvador, A. Vidal, F. Moreno, T. Riesgo, Univ. Politcnica de Madrid (Spain); L. Sekanina, Brno Univ. of Technology (Czech Republic)
- 8067 05 **Partial reconfiguration of a peripheral in an FPGA-based SoC to analyse performance-area behaviour** [8067-04]
A. Cardona, Univ. Autnoma de Barcelona (Spain); Y. Guo, Univ. Autnoma de Barcelona (Spain) and Institut de Cincies de l'Espai (Spain); C. Ferrer, Univ. Autnoma de Barcelona (Spain) and Institut de Microelectrnica de Barcelona (Spain)
- 8067 06 **Cost and energy efficient reconfigurable embedded platform using Spartan-6 FPGAs** [8067-05]
A. Otero, M. Llins, M. L. Lombardo, J. Portilla, E. de la Torre, T. Riesgo, Univ. Politcnica de Madrid (Spain)

SESSION 2 WIRELESS COMMUNICATION SYSTEMS

- 8067 07 **Performance analysis of 802.15.4 wireless standard** [8067-06]
E. Losavio, S. Orcioni, M. Conti, Univ. Politecnica delle Marche (Italy)
- 8067 08 **RFID-based wake-up system for wireless sensor networks** [8067-07]
A. Sanchez, J. Aguilar, S. Blanc, J. J. Serrano, Univ. Politcnica de Valncia (Spain)
- 8067 09 **Wireless videosurveillance over 802.15.4** [8067-08]
M. Conti, M. Telari, S. Orcioni, Univ. Politecnica delle Marche (Italy)
- 8067 0A **Simulation of impulse response for indoor wireless optical channels using 3D CAD models** [8067-09]
S. Rodrguez, B. R. Mendoza, G. Miranda, C. Segura, Univ. of La Laguna (Spain); R. Prez Jimnez, Univ. of Las Palmas de Gran Canaria (Spain)

- 8067 0B **A 55 μ W programmable gain amplifier with constant bandwidth for a direct conversion receiver** [8067-10]
J. Masuch, M. Delgado-Restituto, Institute of Microelectronics of Seville (Spain)
- 8067 0C **Multi-user THSS system for indoor wireless optical communications with angle-diversity detection** [8067-11]
S. Rodríguez, B. R. Mendoza, J. R. Álvarez, O. González, A. Ayala, Univ. of La Laguna (Spain)

SESSION 3 OFF-CHIP AND ON-CHIP COMMUNICATIONS

- 8067 0D **Heterogeneous transmission and parallel computing platform (HTPCP) for remote sensing applications** [8067-12]
Y. Guo, Institut de Ciències de l'Espai (Spain) and Univ. Autònoma de Barcelona (Spain); A. Rius, S. Ribó, Univ. Autònoma de Barcelona (Spain); C. Ferrer, Univ. Autònoma de Barcelona
- 8067 0E **Low-power, high-speed FFT processor for MB-OFDM UWB application** [8067-13]
G. Liang, D. He, E. de la Torre, T. Riesgo, Univ. Politécnica de Madrid (Spain)
- 8067 0F **SystemC modelling of wireless communication channel** [8067-14]
M. Conti, S. Orcioni, Univ. Politecnica delle Marche (Italy)
- 8067 0G **Hardware-software-co-design of parallel and distributed systems using a behavioural programming and multi-process model with high-level synthesis** [8067-15]
S. Bosse, Univ. of Bremen (Germany) and ISIS Sensorial Materials Scientific Ctr. (Germany)
- 8067 0H **Dynamically reconfigurable router for NoC congestion reduction** [8067-16]
J. E. Rosales, F. Tobajas, V. de Armas, J. A. Mori, R. Sarmiento, Univ. de Las Palmas de Gran Canaria (Spain)
- 8067 0I **NoC emulation framework based on Arteris NoC solution for multiprocessor system-on-chip** [8067-17]
J. A. Mori, F. Tobajas, V. de Armas, R. Sarmiento, Univ. de Las Palmas de Gran Canaria (Spain)

SESSION 4 MULTIMEDIA AND HIGH PERFORMANCE ARCHITECTURES

- 8067 0J **Performance analysis of the scalable video coding (SVC) extension of H.264/AVC for constrained scenarios** [8067-18]
N. Suarez, G. M. Callico, S. Lopez, J. Lopez, R. Sarmiento, Univ. de Las Palmas de Gran Canaria (Spain)
- 8067 0K **Scalable 2D architecture for H.264 SVC deblocking filter with reconfiguration capabilities for on-demand adaptation** [8067-19]
T. Cervero, Univ. of Las Palmas de Gran Canaria (Spain); A. Otero, E. de la Torre, Polytechnic Univ. of Madrid (Spain); S. López, G. M. Callicó, Univ. of Las Palmas de Gran Canaria (Spain); T. Riesgo, Polytechnic Univ. of Madrid (Spain); R. Sarmiento, Univ. of Las Palmas de Gran Canaria (Spain)

- 8067 OM **Closing the gap between software and hardware super-resolution image reconstruction: provision of high-quality output** [8067-21]
T. Szydzik, G. M. Callico, A. Nunez, Univ. of Las Palmas de Gran Canaria (Spain)
- 8067 ON **Area-delay trade-offs of texture decompressors for a graphics processing unit** [8067-22]
E. Novoa Súañer, P. Ituero, M. López-Vallejo, Univ. Politécnica de Madrid (Spain)
- 8067 OO **Evaluation of elementary functions without range reduction** [8067-23]
F. A. Meireles, Univ. do Porto (Portugal); A. J. Araújo, INESC Porto (Portugal)

SESSION 5 IC DESIGN

- 8067 OP **Challenges facing academic research in commercializing event-detector implantable devices for an in-vivo biomedical subcutaneous device for biomedical analysis** [8067-24]
E. Juanola-Feliu, J. Colomer-Farrarons, P. Miribel-Català, Univ. of Barcelona (Spain); J. Samitier, Univ. of Barcelona (Spain), Institute for Bioengineering of Catalonia (Spain), and Biomedical Research Networking Ctr. in Bioengineering, Biomaterials and Nanomedicine (Spain); J. Valls-Pasola, Univ. of Barcelona (Spain)
- 8067 OQ **Discrete to full custom ASIC solutions for bioelectronic applications** [8067-25]
J. Punter-Villagrasa, Univ. of Barcelona (Spain) and Institute for Bioengineering of Catalonia (Spain); J. Colomer-Farrarons, P. Miribel-Català, M. Puig-Vidal, Univ. of Barcelona (Spain); J. Samitier, Univ. of Barcelona (Spain) and Institute for Bioengineering of Catalonia (Spain)
- 8067 OR **VLSI design of low-leakage single-ended 6T SRAM cell** [8067-26]
S. Solanky, F. Frustaci, P. Corsonello, Univ. of Calabria (Italy)
- 8067 OT **Effect of separation and depth of N⁺ diffusions in the quality factor and tuning range of PN varactors** [8067-29]
M. Marrero-Martín, T. Szydzik, J. García, B. González, A. Hernández, Univ. de Las Palmas de Gran Canaria (Spain)

SESSION 6 MEASURING, DETECTING AND OBSCURING DEFECTS AND EFFECTS

- 8067 OU **Automatic vector generation guided by a functional metric (Invited Paper)** [8067-30]
I. Ugarte, P. Sanchez, Univ. of Cantabria (Spain)
- 8067 OV **Energy consumption estimation of an OMAP-based Android operating system** [8067-31]
G. González, E. Juárez, J. J. Castro, C. Sanz, Univ. Politécnica de Madrid (Spain)
- 8067 OW **SCA security verification on wireless sensor network node** [8067-32]
W. He, C. Pizarro, E. de la Torre, J. Portilla, T. Riesgo, Univ. Politécnica de Madrid (Spain)
- 8067 OX **Self-repairing SRAM architecture to mitigate the inter-die process variations at 65nm technology** [8067-33]
S. Kansal, M. Lanuzza, P. Corsonello, Univ. of Calabria (Italy)
- 8067 OY **Analytical modeling of glitch propagation in nanometer ICs** [8067-34]
X. Gili, S. Barceló, S. A. Bota, J. Segura, Univ. de les Illes Balears (Spain)

POSTER SESSION

- 8067 OZ **Evaluation of MOBILE-based gate-level pipelining augmenting CMOS with RTDs** [8067-28]
J. Nuñez, M. J. Avedillo, J. M. Quintana, IMSE-CNM-CSIC (Spain) and Univ. of Seville (Spain)

Author Index

Conference Committee

Symposium Chair

Thomas Becker, EADS Innovation Works (Germany)

Symposium Cochairs

José Feliciano López, Universidad de Las Palmas de Gran Canaria
(Spain)

Gerhard Krötz, Hochschule Kempten (Germany)

Symposium Local Chair

Cestmír Ondrůšek, Technical University of Brno (Czech Republic)

Conference Chair

Teresa Riesgo, Universidad Politécnica de Madrid (Spain)

Conference Cochairs

Eduardo de la Torre-Arnanz, Universidad Politécnica de Madrid (Spain)

Peter Langendörfer, IHP GmbH (Germany)

Program Committee

Said Fares Al-Sarawi, The University of Adelaide (Australia)

Mladen Berekovic, TUBS (Germany)

Sebastián A. Bota, Universitat de les Illes Balears (Spain)

João Canas Ferreira, Universidade do Porto (Portugal)

Massimo Conti, Università Politecnica delle Marche (Italy)

Angel de Castro, Universidad Autónoma de Madrid (Spain)

Francisco V. Fernández, Instituto de Microelectrónica de Sevilla
(Spain)

Eby G. Friedman, University of Rochester (United States)

Eckhard Grass, IHP GmbH (Germany)

Milos Krstic, IHP GmbH (Germany)

Sebastián López Suárez, Universidad de Las Palmas de Gran Canaria
(Spain)

Celia López-Ongil, Universidad Carlos III de Madrid (Spain)

Antonio López-Martín, Universidad Pública de Navarra (Spain)

Gustavo Marrero Callicó, Universidad de Las Palmas de Gran Canaria
(Spain)

Salvador Mir, TIMA Laboratoire (France)

Pere Lluís Miribel-Català, Universitat de Barcelona (Spain)

Félix Moreno, Universidad Politécnica de Madrid (Spain)
Antonio Núñez Ordóñez, Universidad de Las Palmas de Gran Canaria (Spain)
Ioannis Papaefstathiou, Technical University of Crete (Greece)
Belén Pérez-Verdú, Centro Nacional de Microelectrónica (Spain)
Jorge Portilla, Universidad Politécnica de Madrid (Spain)
Juan José Rodríguez Andina, Universidad de Vigo (Spain)
Ángel B. Rodríguez-Vázquez, Centro Nacional de Microelectrónica (Spain)
Marco Domenico Santambrogio, Politecnico di Milano (Italy)
César Sanz, Universidad Politécnica de Madrid (Spain)
Gilles Sassatelli, Laboratoire d'Informatique de Robotique et de Microelectronique de Montpellier (France)
José Silva Matos, Universidade do Porto (Portugal)
Dirk Stroobandt, Universiteit Gent (Belgium)
Walter Stechele, Technische Universität München (Germany)

Session Chairs

- 1 Bio-inspired and Reconfigurable Systems
Eduardo de la Torre-Arnanz, Universidad Politécnica de Madrid (Spain)
- 2 Wireless Communication Systems
Massimo Conti, Università Politecnica delle Marche (Italy)
- 3 Off-chip & On-chip Communications
Lambert Spaanenburg, Lund University (Sweden)
- 4 Multimedia and High Performance Architectures
Lukáš Sekanina, Brno University of Technology (Czech Republic)
- 5 IC Design
Eduardo Juarez, Universidad Politécnica de Madrid (Spain)
- 6 Measuring, Detecting and Obscuring Defects and Effects
Torsten Schmidt, Technische Universität Dresden (Germany)
José Feliciano López, Universidad de Las Palmas de Gran Canaria (Spain)