




Office of Business Enterprises
Duplication Services Section

THIS IS TO CERTIFY that the collections of the Library of Congress contain a book entitled **HIGH-SPEED COMPUTING, DIGITAL SIGNAL PROCESSING, AND FILTERING USING RECONFIGURABLE LOGIC** : 20-21 November 1996, Boston, Massachusetts / John Schewel, ... [et al.], chairs/editors; sponsored ... by SPIE--the International Society for Optical Engineering. Published: Bellingham, Wash., USA: SPIE, c1996. Call number TK7895.G36 H55 1996, and that the attached photocopies--Cover, Title, Copyright, Table of Contents, and the article, "Using Reconfigurable Hardware to Customize Memory Hierarchies, Peixin Zhong and Margaret Martonosi [pages 237-248] - are a true representation from that work.

THIS IS TO CERTIFY FURTHER, that work is marked with a Library of Congress Copyright Office stamp that bears the date November 19, 1996.

IN WITNESS WHEREOF, the seal of the Library of Congress is affixed hereto on October 11, 2018.



Rosalina Delgado-Jones
Assistant Business Enterprises Officer
Office of Business Enterprises
Library of Congress



101 Independence Avenue, SE Washington, DC 20540-4917 Tel 202.707.5650 www.loc.gov;
duplicationservices@loc.gov

PROCEEDINGS



SPIE—The International Society for Optical Engineering

*High-Speed Computing, Digital
Signal Processing, and Filtering
Using Reconfigurable Logic*

John Schewel
Peter M. Athanas
V. Michael Bove, Jr.
John Watson
Chairs/Editors

20–21 November 1996
Boston, Massachusetts



Volume 2914

2



SPIE—The International Society for Optical Engineering

PROCEEDINGS

High-Speed Computing, Digital Signal Processing, and Filtering Using Reconfigurable Logic

John Schewel
Peter M. Athanas
V. Michael Bove, Jr.
John Watson
Chairs/Editors

20–21 November 1996
Boston, Massachusetts

Sponsored and Published by
SPIE—The International Society for Optical Engineering



Volume 2914

SPIE is an international technical society dedicated to advancing engineering and scientific applications of optical, photonic, imaging, electronic, and optoelectronic technologies.



TK 7895
G36 H55
1996



The papers appearing in this book comprise the proceedings of the meeting mentioned on the cover and title page. They reflect the authors' opinions and are published as presented and without change, in the interests of timely dissemination. Their inclusion in this publication does not necessarily constitute endorsement by the editors or by SPIE.

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

Author(s), "Title of paper," in *High-Speed Computing, Digital Signal Processing, and Filtering Using Reconfigurable Logic*, John Schewel, Peter M. Athanas, V. Michael Bove, Jr., John Watson, Editors, Proc. SPIE 2914, page numbers (1996).

Library of Congress Catalog Card No. 96-69766
ISBN 0-8194-2316-5

6-6-97 uc/2

Published by
SPIE—The International Society for Optical Engineering
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone 360/676-3290 (Pacific Time) • Fax 360/647-1445

Copyright ©1996, The 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 \$6.00 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 <http://www.directory.net/copyright/>. 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 0-8194-2316-5/96/\$6.00.

Printed in the United States of America.

Contents

- vii *Conference Committee*
ix *Introduction*

SESSION 1 BREAKTHROUGHS IN ALGORITHMS, IMAGING, DSP, AND NUMERICAL ANALYSIS I

- 2 **Signed-digit online floating-point arithmetic for FPGAs** [2914-01]
A. Tangtrakul, B. Yeung, T. A. Cook, Rutgers Univ.
- 14 **Design of high-radix digit slices for online computations** [2914-02]
A. F. Tenca, M. D. Ercegovac, Univ. of California/Los Angeles
- 26 **Performance evaluation of FPGA implementations of high-speed addition algorithms**
[2914-03]
W. W. H. Yu, S. Xing, Univ. of Hong Kong
- 34 **250-MHz correlation using high-performance reconfigurable computing engines** [2914-04]
B. Von Herzen, Rapid Prototypes, Inc.
- 44 **Implementation of a finite difference method on a custom computing platform** [2914-05]
K. J. Paar, P. M. Athanas, Virginia Polytechnic Institute and State Univ.; C. M. Edwards, Naval Underwater Warfare Ctr.
- 54 **User-configurable data acquisition systems** [2914-06]
G. Brown, Cornell Univ.

SESSION 2 BREAKTHROUGHS IN ALGORITHMS, IMAGING, DSP, AND NUMERICAL ANALYSIS II

- 66 **Internal sorting and FPGA** [2914-07]
A. Beechick, Arrow Connection; S. Casselman, Virtual Computer Corp.; L. D. Yarbrough, Mathematical and Computational Sciences
- 72 **Polynomial-transform-based approach to computing 2D DFTs using reconfigurable computers**
[2914-08]
C. H. Dick, La Trobe Univ. (Australia); F. J. Harris, San Diego State Univ.
- 84 **Configurable adaptive signal processing subsystem for various applications in telemetry, navigation, and telecommunication** [2914-09]
H. Chandran, Navtel Systems SA, Ltd. (France)
- 90 **Dynamic hardware video processing platform** [2914-10]
R. Andraka, Andraka Consulting Group
- 100 **DSP filters in FPGAs for image processing applications** [2914-11]
B. Taylor, Giga Operations Corp.
- 110 **Image processing using reconfigurable FPGAs** [2914-12]
L. Ferguson, Atmel Corp.

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.