

PROCEEDINGS

**Electronic
Imaging**
Science and Technology

Multimedia on Mobile Devices 2008

Reiner Creutzburg

Jarmo H. Takala

Editors

28–29 January 2008

San Jose, California, USA

Sponsored and Published by

IS&T—The Society for Imaging Science and Technology

SPIE

Volume 6821

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 publishers are 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 *Multimedia on Mobile Devices 2008*, edited by Reiner Creutzburg, Jarmo H. Takala, Proceedings of SPIE-IS&T Electronic Imaging, SPIE Vol. 6821, Article CID Number (2008).

ISSN 0277-786X

ISBN 9780819469939

Copublished 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

and

IS&T—The Society for Imaging Science and Technology

7003 Kilworth Lane, Springfield, Virginia, 22151 USA

Telephone +1 703 642 9090 (Eastern Time) · Fax +1 703 642 9094

imaging.org

Copyright © 2008, Society of Photo-Optical Instrumentation Engineers and The Society for Imaging Science and Technology.

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 the publishers 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/08/\$18.00.

Printed in the United States of America.

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*

MULTIMEDIA APPLICATIONS

- 6821 02 **Real-time scalable visual analysis on mobile devices** [6821-01]
A. Pattath, D. S. Ebert, Purdue Univ. (USA); R. A. May, Pacific Northwest National Lab. (USA);
T. F. Collins, Purdue Homeland Security Institute (USA); W. Pike, Pacific Northwest National
Lab. (USA)
- 6821 03 **REST based mobile applications** [6821-02]
M. Rambow, T. Preuss, J. Berdux, Univ. of Applied Sciences Brandenburg (Germany);
M. Conrad, Univ. of Bedfordshire (United Kingdom)
- 6821 04 **Open source OCR framework using mobile devices** [6821-03]
S. Z. Zhou, S. O. Gilani, S. Winkler, National Univ. of Singapore (Singapore)

VIDEO CODING

- 6821 05 **A high-level simulator for the H.264/AVC decoding process in multi-core systems** [6821-04]
F. H. Seitner, R. M. Schreier, M. Bleyer, M. Gelautz, Vienna Univ. of Technology (Austria)
- 6821 06 **Human visual system based adaptive inter quantization** [6821-05]
J. Li, J. Koivusaari, J. Takala, M. Gabbouj, Tampere Univ. of Technology (Finland); H. Chen,
Jilin Univ. (China)
- 6821 07 **Wyner-Ziv video coding based on a new hierarchical block matching algorithm** [6821-06]
R. K. Liu, H. B. Zhao, Z. Yue, Beijing Univ. of Aeronautics and Astronautics (China)

INVITED PAPER I

- 6821 08 **New video applications on mobile communication devices (Invited Paper)** [6821-07]
O. J. Silvén, J. Hannuksela, M. Bordallo-López, Univ. of Oulu (Finland); M. Turtinen,
M. Niskanen, Visidon Ltd. (Finland); J. Boutellier, Univ. of Oulu (Finland); M. Vehviläinen,
M. Tico, Nokia Research Ctr. (Finland)

MEDIA PROCESSING

- 6821 09 **Non-photorealistic rendering for energy conservation** [6821-08]
Y. Nimmagadda, Y.-H. Lu, E. J. Delp, D. S. Ebert, Purdue Univ. (USA)
- 6821 0A **An image registration technique aimed at super resolution on mobile devices** [6821-09]
M. Georgiev, I. Todorov, A. Boev, A. Gotchev, K. Egiazarian, Tampere Univ. of Technology
(Finland)

- 6821 OB **Selective frame dropping based on hypothetical reference decoder buffer model for initial buffering delay reduction** [6821-10]
S. Deshpande, Sharp Labs. of America, Inc. (USA)

MULTIMEDIA CONTENT PROTECTION

- 6821 OC **Digital watermarking in parametric slant transform domain** [6821-11]
J. Xie, Tufts Univ. (USA); S. Agaian, Univ. of Texas at San Antonio (USA); J. Noonan, Tufts Univ. (USA)

SYSTEMS FOR MULTIMEDIA

- 6821 OD **Context adaptive binary arithmetic decoding on transport triggered architecture** [6821-14]
J. Rouvinen, Univ. of Oulu (Finland); P. Jämskeläinen, Tampere Univ. of Technology (Finland); T. Rintaluoma, On2 Technologies (Finland); O. Silvén, Univ. of Oulu (Finland); J. Takala, Tampere Univ. of Technology (Finland)
- 6821 OE **The Rosetta phone: a hand-held device for automatic translation of signs in natural images** [6821-15]
S. A. R. Jafri, A. K. Mikkilineni, M. Boutin, E. J. Delp, Purdue Univ. (USA)
- 6821 OF **Software-only implementation of DBV-H** [6821-16]
D. Iancu, H. Ye, J. Glossner, A. Iancu, Sandbridge Technologies, Inc. (USA); J. Takala, Tampere Univ. of Technology (Finland)
- 6821 OG **Energy efficiency analysis of multi-stream MPEG-4 decoder systems** [6821-17]
S. Lafond, Åbo Akademi Univ. (Finland); J. Boutellier, Univ. of Oulu (Finland); J. Lilius, Åbo Akademi Univ. (Finland); O. Silvén, Univ. of Oulu (Finland)
- 6821 OI **A mobile video surveillance system with intelligent object analysis** [6821-19]
Y.-K. Wang, L.-Y. Wang, Y.-H. Hu, Fu Jen Univ. (Taiwan)

HCI ISSUES ON MULTIMEDIA I

- 6821 OK **Performance analysis of visual tracking algorithms for motion-based user interfaces on mobile devices** [6821-21]
S. Winkler, K. Rangaswamy, J. Tedjokusumo, Z. Zhou, National Univ. of Singapore (Singapore)
- 6821 OL **Profiles of the evaluators: impact of psychographic variables on the consumer-oriented quality assessment of mobile television** [6821-22]
S. Jumisko-Pyykkö, Tampere Univ. of Technology (Finland); J. Häkkinen, Nokia Research Ctr. (Finland) and Univ. of Helsinki (Finland)
- 6821 OM **An infrastructure to manage errors and originalities in mobile multimedia development** [6821-23]
D. Oltmanns, TFH-Berlin (Germany); H. Hörning, R. Hörning, Biting Bit GmbH (Germany); S. Edlich, TFH-Berlin (Germany); J. Schlapinski, Biting Bit GmbH (Germany)

HCI ISSUES ON MULTIMEDIA II

- 6821 OP **Personalized summarization using user preference for m-learning** [6821-26]
S. Lee, S. Yang, Y. M. Ro, Information and Communications Univ. (South Korea); H. J. Kim,
Korea Univ. (South Korea)

POSTER SESSION

- 6821 OQ **Video contents authoring system for efficient consumption on portable multimedia device**
[6821-27]
H.-S. Min, S. H. Jin, Y. B. Lee, Y. M. Ro, Information and Communications Univ. (South Korea)
- 6821 OR **Reducing the overheads of hardware acceleration through datapath integration** [6821-28]
P. Jääskeläinen, H. Kultala, T. Pitkänen, J. Takala, Tampere Univ. of Technology (Finland)
- 6821 OS **Flexible management of shared resources on multiprocessor system on chip** [6821-29]
A. Rasmus, A. Kulmala, E. Salminen, T. D. Hämäläinen, M. Hännikäinen, Tampere Univ.
of Technology (Finland)
- 6821 OV **Automatic Bluetooth testing for mobile multi-user applications** [6821-32]
D. Luck, TFH-Berlin (Germany); H. Hörning, Biting Bit GmbH (Germany); S. Edlich, TFH-Berlin
(Germany)

Author Index

Conference Committee

Symposium Chair

Nitin Sampat, Rochester Institute of Technology (USA)

Conference Chairs

Reiner Creutzburg, Fachhochschule Brandenburg (Germany)

Jarmo H. Takala, Tampere University of Technology (Finland)

Program Committee

David Akopian, The University of Texas at San Antonio (USA)

Alan Chalmers, University of Bristol (United Kingdom)

Jianfei Cai, Nanyang Technological University (Singapore)

Surendar Chandra, University of Notre Dame (USA)

Chang Wen Chen, Florida Institute of Technology (USA)

Kenneth J. Crisler, Motorola, Inc. (USA)

David S. Doermann, University of Maryland, College Park (USA)

Uwe Dummman, Siemens AG (Germany)

Elizabeth Dykstra-Erickson, Kinoma, Inc. (USA)

Lajos Hanzo, University of Southampton (United Kingdom)

Zhihai He, University of Missouri, Columbia (USA)

Hendrik O. Knoche, University College London (United Kingdom)

Xin Li, West Virginia University (USA)

Manzur M. Murshed, Monash University (USA)

Sethuraman Panchanathan, Arizona State University (USA)

Kari A. Pulli, Nokia Research Center Cambridge (USA)

Matthias Rauterberg, Technische Universiteit Eindhoven (Netherlands)

Phillip A. Regalia, Institut National des Télécommunications (France)

Olli J. Silvén, University of Oulu (Finland)

Haitao Zheng, Microsoft Research Asia (China)

Session Chairs

- 1 Multimedia Applications
Olli J. Silvén, University of Oulu (Finland)

- 2 Video Coding
Reiner Creutzburg, Fachhochschule Brandenburg (Germany)

- 3 Invited Paper I
Reiner Creutzburg, Fachhochschule Brandenburg (Germany)
- 4 Media Processing
Atanas P. Gotchev, Tampere University of Technology (Finland)
- 5 Multimedia Content Protection
Reiner Creutzburg, Fachhochschule Brandenburg (Germany)
- 6 Systems for Multimedia
Jarmo H. Takala, Tampere University of Technology (Finland)
- 7 Invited Paper II
Jarmo H. Takala, Tampere University of Technology (Finland)
- 8 HCI Issues on Multimedia I
Olli J. Silvén, University of Oulu (Finland)
- 9 HCI Issues on Multimedia II
Jarmo H. Takala, Tampere University of Technology (Finland)