

Tai-hoon Kim · Hojjat Adeli
William I. Grosky · Niki Pissinou
Timothy K. Shih · Edward J. Rothwell
Byeong-Ho Kang · Seung-Jung Shin (Eds.)

Communications in Computer and Information Science

263

Multimedia, Computer Graphics and Broadcasting

International Conference, MulGraB 2011
Held as Part of the Future Generation
Information Technology Conference, FGIT 2011
in Conjunction with GDC 2011
Jeju Island, Korea, December 2011, Proceedings, Part II

Part 2

Tai-hoon Kim Hojjat Adeli
William I. Grosky Niki Pissinou
Timothy K. Shih Edward J. Rothwell
Byeong-Ho Kang Seung-Jung Shin (Eds.)

Multimedia, Computer Graphics and Broadcasting

International Conference, MulGraB 2011
Held as Part of the Future Generation
Information Technology Conference, FGIT 2011
in Conjunction with GDC 2011
Jeju Island, Korea, December 8-10, 2011
Proceedings, Part II

Volume Editors

Tai-hoon Kim

Hannam University, Daejeon, Korea

E-mail: taihoonn@hannam.ac.kr

Hojjat Adeli

The Ohio State University, Columbus, OH, USA

E-mail: adeli.1@osu.edu

William I. Grosky

University of Michigan, Dearborn, MI, USA

E-mail: wgrosky@umich.edu

Niki Pissinou

Florida International University, Miami, FL, USA

E-mail: pissinou@fiu.edu

Timothy K. Shih

National Taipei University of Education, Taipei City, Taiwan, R.O.C.

E-mail: tshih@cs.tku.edu.tw

Edward J. Rothwell

Michigan State University, East Lansing, MI, USA

E-mail: rothwell@egr.msu.edu

Byeong-Ho Kang

University of Tasmania, Hobart, TAS, Australia

E-mail: byeong.kang@utas.edu.au

Seung-Jung Shin

Hansei University, Gyeonggi-do, Korea

E-mail: sshin@ncsu.edu

ISSN 1865-0929

e-ISSN 1865-0937

ISBN 978-3-642-27185-4

e-ISBN 978-3-642-27186-1

DOI 10.1007/978-3-642-27186-1

Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: Applied for

CR Subject Classification (1998): C.2, H.4, I.2, H.3, D.2, H.5

© Springer-Verlag Berlin Heidelberg 2011

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Foreword

Multimedia, computer graphics and broadcasting are areas that attract many professionals from academia and industry for research and development. The goal of the MulGraB conference is to bring together researchers from academia and industry as well as practitioners to share ideas, problems and solutions relating to the multifaceted aspects of multimedia, computer graphics and broadcasting.

We would like to express our gratitude to all of the authors of submitted papers and to all attendees for their contributions and participation.

We acknowledge the great effort of all the Chairs and the members of Advisory Boards and Program Committees of the above-listed event. Special thanks go to SERSC (Science and Engineering Research Support Society) for supporting this conference.

We are grateful in particular to the speakers who kindly accepted our invitation and, in this way, helped to meet the objectives of the conference.

December 2011

Chairs of MulGraB 2011

Preface

We would like to welcome you to the proceedings of the 2011 International Conference on Multimedia, Computer Graphics and Broadcasting (MulGraB 2011) — the partnering event of the Third International Mega-Conference on Future-Generation Information Technology (FGIT 2011) held during December 8–10, 2011, at Jeju Grand Hotel, Jeju Island, Korea

MulGraB 2011 focused on various aspects of advances in multimedia, computer graphics and broadcasting. It provided a chance for academic and industry professionals to discuss recent progress in the related areas. We expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject.

We would like to acknowledge the great effort of the MulGrab 2011 Chairs, Committees, International Advisory Board, Special Session Organizers, as well as all the organizations and individuals who supported the idea of publishing this volume of proceedings, including the SERSC and Springer.

We are grateful to the following keynote, plenary and tutorial speakers who kindly accepted our invitation: Hsiao-Hwa Chen (National Cheng Kung University, Taiwan), Hamid R. Arabnia (University of Georgia, USA), Sabah Mohammed (Lakehead University, Canada), Ruay-Shiung Chang (National Dong Hwa University, Taiwan), Lei Li (Hosei University, Japan), Tadashi Dohi (Hiroshima University, Japan), Carlos Ramos (Polytechnic of Porto, Portugal), Marcin Szczuka (The University of Warsaw, Poland), Gerald Schaefer (Loughborough University, UK), Jinan Fiaidhi (Lakehead University, Canada) and Peter L. Stanchev (Kettering University, USA), Shusaku Tsumoto (Shimane University, Japan), Jemal H. Abawajy (Deakin University, Australia).

We would like to express our gratitude to all of the authors and reviewers of submitted papers and to all attendees, for their contributions and participation, and for believing in the need to continue this undertaking in the future.

December 2011

Tai-hoon Kim
Hojjat Adeli
William I. Grosky
Niki Pissinou
Timothy K. Shih
Ed. Rothwell
Byeongho Kang
Seung-Jung Shin

Organization

Honorary Chair

Jeong-Jin Kang

Dong Seoul University, Korea

General Co-chairs

William I. Grosky

University of Michigan-Dearborn, USA

Niki Pissinou

Florida International University, USA

Timothy K. Shih

National Taipei University of Education,
Taiwan

Ed Rothwell

Michigan State University, USA

Program Co-chairs

Tai-hoon Kim

GVSA and University of Tasmania, Australia

Byeongho Kang

University of Tasmania, Australia

Seung-Jung Shin

Hansei University, Korea

Workshop Chair

Byungjoo Park

Hannam University, Korea

Publication Chair

Yongho Choi

Jungwon University, Korea

International Advisory Board

Aboul Ella Hassanien

Cairo University, Egypt

Andrea Omicini

DEIS, Università di Bologna, Italy

Bozena Kostek

Gdansk University of Technology, Poland

Cao Jiannong

Hong Kong Polytechnic University, Hong Kong

Cas Apanowicz

Ministry of Education, Canada

Ching-Hsien Hsu

Chung Hua University, Taiwan

Claudia Linnhoff-Popien

Ludwig-Maximilians-Universität München,
Germany

Daqing Zhang

Institute for Infocomm Research (I2R),
Singapore

Diane J. Cook

University of Texas at Arlington, USA

Frode Eika Sandnes

Oslo University College, Norway

Guoyin Wang	CQPT, Chongqing, China
Hamid R. Arabnia	The University of Georgia, USA
Han-Chieh Chao	National Ilan University, Taiwan
Ing-Ray Chen	Virginia Polytechnic Institute and State University, USA
Jae-Sang Cha	Seoul National University of Science and Technology, Korea
Jian-Nong Cao	Hong Kong Polytechnic University, Hong Kong
Krzysztof Pawlikowski	University of Canterbury, New Zealand
Krzysztof Marasek	PJIT, Warsaw, Poland
Lionel Ni	The Hong Kong University of Science and Technology, Hong Kong
Mahmut Kandemir	Pennsylvania State University, USA
Matt Mutka	Michigan State University, USA
Mei-Ling Shyu	University of Miami, USA
Rajkumar Buyya	The University of Melbourne, Australia
Robert Young Chul Kim	Hongik University, Korea
Sajal K. Das	University Texas at Arlington, USA
Sajid Hussain	Acadia University, Canada
Sankar K. Pal	Indian Statistical Institute, India
Schahram Dustdar	Vienna University of Technology, Austria
Seng W. Loke	La Trobe University, Australia
Stefanos Gritzalis	University of the Aegean, Greece
Yang Xiao	University of Alabama, USA
Yong-Gyu Jung	Eulji University, Korea
Zbigniew W. Ras	University of North Carolina, USA
Aboul Ella Hassanien	Cairo University, Egypt

Program Committee

Abdelwahab	Chengcui Zhang	Gérard Medioni
Hamou-Lhadj	Chi Sung Lai	Hae-Duck Joshua Jeong
Ahmet Koltuksuz	Ching-Hsien Hsu	Hai Jin Huazhong
Alexander Loui	Christine F. Maloigne	Hiroaki Kikuchi
Alexei Sourin	Dae-Hyun Ryu	Hironori Washizaki
Alicja Wiczorkowska	Daniel Thalmann	Hongji Yang
Andrew Kusiak	Dieter Gollmann	Hoon Jin
Andrzej Dzielinski	Dimitris Iakovidis	Hyun-Sung Kim
Anthony Lewis Brooks	Doo-Hyun Kim	Hyun-Tae Kim
Atsuko Miyaji	Do-Hyeun Kim	Jacques Blanc-Talon
Biplab K. Sarker	Eung-Nam Ko	Jalal Al-Muhtadi
Ch. Z. Patrikakis	Fabrice Mériaudeau	Jang Sik Park
Chantana	Fangguo Zhang	Javier Garcia-Villalba
Chantrapornchai	Francesco Masulli	Jean-Luc Dugelay
Chao-Tung Yang	Federica Landolfi	Jemal H. Abawajy

Ji-Hoon Yang	Mototaka Suzuki	Seung-Hyun Seo
Jin Kwak	Myung-Jae Lim	Shin Jin Kang
Jiyoung Lim	Nadia	Shingo Ichii
Jocelyn Chanussot	Magnenat-Thalmann	Shu-Ching Chen
Jong-Wook Jang	Neungsoo Park	Sidhi Kulkarni
Joonsang Baek	Nicoletta Sala	Stefan Katzenbeisser
Junzhong Gu	Nikitas Assimakopoulos	Stuart J. Barnes
Karl Leung	Nikos Komodakis	Sun-Jeong Kim
Kee-Hong Um	Olga Sourina	Swapna Gokhale
Kenneth Lam	Pablo de Heras	Swee-Huay Heng
Khaled El-Maleh	Ciechomski	Taenam Cho
Khalil Drira	Pao-Ann Hsiung	Tony Shan
Ki-Young Lee	Paolo D'Arco	Umberto Villano
Kouichi Sakurai	Paolo Remagnino	Wasfi G. Al-Khatib
Kyung-Soo Jang	Rainer Malaka	Yao-Chung Chang
Larbi Esmahi	Raphael C.-W. Phan	Yi Mu
Lejla Batina	Robert G. Reynolds	Yong-Ho Seo
Lukas Ruf	Robert G. Rittenhouse	Yong-Kap Kim
MalRey Lee	Rodrigo Mello	Yong-Soon Im
Marco Rocchetti	Roman Neruda	Yoo-Sik Hong
Mark Manulis	Rui Zhang	Young-Dae Lee
Maytham Safar	Ryszard Tadeusiewicz	Young-Hwa An
Mei-Ling Shyu	Sagarmay Deb	Yo-Sung Ho
Min Hong	Salah Bourennane	Young Ik Eom
Miroslaw Swiercz	Seenith Siva	You-Jin Song
Mohan S Kankanhalli	Serap Atay	

Special Session Organizers

YangSun Lee
Kwan-Hee Yoo
Nakhoon Baek

Table of Contents – Part II

Logical User Interface Modeling for Multimedia Embedded Systems <i>Saehwa Kim</i>	1
Efficient Doppler Spread Compensation with Frequency Domain Equalizer and Turbo Code <i>Haeseong Jeong and Heung-Gyoon Ryu</i>	9
Machine Learning-Based Soccer Video Summarization System <i>Hossam M. Zawbaa, Nashwa El-Bendary, Aboul Ella Hassanien, and Tai-hoon Kim</i>	19
A Focus on Comparative Analysis: Key Findings of MAC Protocols for Underwater Acoustic Communication According to Network Topology <i>Jin-Young Lee, Nam-Yeol Yun, Sardorbek Muminov, Seung-Joo Lee, and Soo-Hyun Park</i>	29
Interference Impact of Mobile WiMAX BS on LTE in TV White Spaces <i>Yanming Cheng, Inkyoung Cho, and Ilkyoo Lee</i>	38
Generating Optimal Fuzzy If-Then Rules Using the Partition of Fuzzy Input Space <i>In-Kyu Park, Gyoo-Seok Choi, and Jong-Jin Park</i>	45
A Design of Embedded Integration Prototyping System Based on AR . . . <i>Sin Kwan Kang, Jung Eun Kim, Hyun Lee, Dong Ha Lee, and Jeong Bae Lee</i>	54
Optimization Conditions of OCSVM for Erroneous GPS Data Filtering <i>Woojoong Kim and Ha Yoon Song</i>	62
An Enhanced Dynamic Signature Verification System for the Latest Smart-Phones <i>Jin-whan Kim</i>	71
Illumination Invariant Motion Estimation and Segmentation <i>Yeonho Kim and Sooyeong Yi</i>	78
Daily Life Mobility of a Student: From Position Data to Human Mobility Model through Expectation Maximization Clustering <i>Hyunuk Kim and Ha Yoon Song</i>	88

A Fast Summarization Method for Smartphone Photos Using Human-Perception Based Color Model	98
<i>Kwanghui Kim, Sung-Hwan Kim, and Hwan-Gue Cho</i>	
Context-Driven Mobile Social Network Discovery System	106
<i>Jiamei Tang and Sangwook Kim</i>	
An Energy Efficient Filtering Approach to In-Network Join Processing in Sensor Network Databases	116
<i>Kyung-Chang Kim and Byung-Jung Oh</i>	
A Genetic Programming Approach to Data Clustering	123
<i>Chang Wook Ahn, Sanghoun Oh, and Moonyoung Oh</i>	
Design and Implementation of a Hand-Writing Message System for Android Smart Phone Using Digital Pen	133
<i>Jong-Yun Yeo, Yong Dae Lee, Sang-Hoon Ji, and Gu-Min Jeong</i>	
Robust Blind Watermarking Scheme for Digital Images Based on Discrete Fractional Random Transform	139
<i>Youngseok Lee and Jongweon Kim</i>	
Performance Evaluation of DAB, DAB+ and T-DMB Audio: Field Trial	146
<i>Myung-Sun Baek, Yonghoon Lee, Sora Park, Geon Kim, Bo-mi Lim, Yun-Jeong Song, and Yong-Tae Lee</i>	
A Case Study on Korean Wave: Focused on K-POP Concert by Korean Idol Group in Paris, June 2011	153
<i>Hyunhee Cha and Seongmook Kim</i>	
Design and Implementation of Emergency Situation System through Multi Bio-signals	163
<i>Ki-Young Lee, Min-Ki Lee, Kyu-Ho Kim, Myung-jae Lim, Jeong-Seok Kang, Hee-Woong Jeong, and Young-Sik Na</i>	
Intelligent Music Recommendation System Based on Cloud Computing	169
<i>Ki-Young Lee, Tae-Min Kwon, Myung-Jae Lim, Kyu-Ho Kim, Jeong-Lae Kim, and Il-Hee Seo</i>	
Handling Frequent Updates of Moving Objects Using the Dynamic Non-uniform Grid	175
<i>Ki-Young Lee, Jeong-Jin Kang, Joung-Joon Kim, Chae-Gyun Lim, Myung-Jae Lim, Kyu-Ho Kim, and Jeong-Lae Kim</i>	
The Guaranteed QoS for Time-Sensitive Traffic in High-Bandwidth EPON	181
<i>Jeong-hyun Cho and Yong-suk Chang</i>	

Robust Vehicle Tracking Multi-feature Particle Filter	191
<i>M. Eren Yildirim, Jongkwan Song, Jangsik Park, Byung Woo Yoon, and Yunsik Yu</i>	
Computationally Efficient Vehicle Tracking for Detecting Accidents in Tunnels	197
<i>Gyuyeong Kim, Hyuntae Kim, Jangsik Park, Jaeho Kim, and Yunsik Yu</i>	
Development of an Android Application for Sobriety Test Using Bluetooth Communication	203
<i>Jangju Kim, Daehyun Ryu, Jangsik Park, Hyuntae Kim, and Yunsik Yu</i>	
Performance of Collaborative Cyclostationary Spectrum Sensing for Cognitive Radio System	210
<i>Yoon Hyun Kim, In Hwan Park, Seung Jong Kim, Jeong Jin Kang, and Jin Young Kim</i>	
Novel Spectrum Sensing for Cognitive Radio Based Femto Networks	220
<i>Kyung Sun Lee, Yoon Hyun Kim, and Jin Young Kim</i>	
Efficient Transmission Scheme Using Transceiver Characteristics for Visible Light Communication Systems	225
<i>In Hwan Park, Yoon Hyun Kim, and Jin Young Kim</i>	
Modification of Feed Forward Process and Activation Function in Back-Propagation	234
<i>Gwang-Jun Kim, Dae-Hyon Kim, and Yong-Kab Kim</i>	
Influential Parameters for Dynamic Analysis of a Hydraulic Control Valve	241
<i>Kyong Uk Yang, Jung Gyu Hur, Gwang-Jun Kim, Dae Hyon Kim, and Yong-Kab Kim</i>	
Fixed-Width Modified Booth Multiplier Design Based on Error Bound Analysis	248
<i>Kyung-Ju Cho, Jin-Gyun Chung, Hwan-Yong Kim, Gwang-Jun Kim, Dae-Ik Kim, and Yong-Kab Kim</i>	
A Performance Enhancement for Ubiquitous Indoor Networking Using VLC-LED Driving Module	257
<i>Geun-Bin Hong, Tae-Su Jang, Kwan-Woong Kim, and Yong-Kab Kim</i>	
Improved Password Mutual Authentication Scheme for Remote Login Network Systems	263
<i>Younghwa An</i>	

Context-Awareness Smart Safety Monitoring System Using Sensor Network	270
<i>Joon-Mo Yang, Jun-Yong Park, So-Young Im, Jung-Hwan Park, and Ryum-Duck Oh</i>	
Spectro-temporal Analysis of High-Speed Pulsed-Signals Based on On-Wafer Optical Sampling	278
<i>Dong-Joon Lee, Jae-Yong Kwon, Tae-Weon Kang, and Joo-Gwang Lee</i>	
e-Test System Based Speech Recognition for Blind Users	284
<i>Myung-Jae Lim, Eun-Young Jung, and Ki-Young Lee</i>	
Improving the Wi-Fi Channel Scanning Using a Decentralized IEEE 802.21 Information Service	290
<i>Fabio Buiati, Luis Javier García Villalba, Delfín Rupérez Cañas, and Tai-hoon Kim</i>	
Grid of Learning Resources in E-learning Communities	295
<i>Julio César Rodríguez Ribón, Luis Javier García Villalba, Tomás Pedro de Miguel Moro, and Tai-hoon Kim</i>	
A Comparison Study between AntOR-Disjoint Node Routing and AntOR-Disjoint Link Routing for Mobile Ad Hoc Networks	300
<i>Delfín Rupérez Cañas, Ana Lucila Sandoval Orozco, Luis Javier García Villalba, and Tai-hoon Kim</i>	
Comparing AntOR-Disjoint Node Routing Protocol with Its Parallel Extension	305
<i>Delfín Rupérez Cañas, Ana Lucila Sandoval Orozco, Luis Javier García Villalba, and Tai-hoon Kim</i>	
Location Acquisition Method Based on RFID in Indoor Environments	310
<i>Kyoung Soo Bok, Yong Hun Park, Jun Il Pee, and Jae Soo Yoo</i>	
A Study on Compatibility between ISM Equipment and GPS System ...	319
<i>Yong-Sup Shim and Il-Kyoo Lee</i>	
A Context Aware Data-Centric Storage Scheme in Wireless Sensor Networks	326
<i>Hyunju Kim, Junho Park, Dongook Seong, and Jaesoo Yoo</i>	
A Continuous Query Processing Method in Broadcast Environments....	331
<i>Yonghun Park, Kyoungsoo Bok, and Jaesoo Yoo</i>	
An Adaptive Genetic Simulated Annealing Algorithm for QoS Multicast Routing	338
<i>Bo Peng and Lei Li</i>	

A Quantified Audio Watermarking Algorithm Based on DWT-DCT	339
<i>De Li, Yingying Ji, and JongWeon Kim</i>	
Features Detection on Industrial 3D CT Data	345
<i>Thi-Chau Ma, Chang-soo Park, Kittichai Suthunyanakit,</i> <i>Min-jae Oh, Tae-wan Kim, Myung-joo Kang, and The-Duy Bui</i>	
Author Index	355

Table of Contents – Part I

Resource Management for Scalable Video Using Adaptive Bargaining Solution	1
<i>Yonghun Lee, Jae-Yoon Jung, and Doug Young Suh</i>	
Improved Resizing MPEG-2 Video Transcoding Method	10
<i>Sung Pil Ryu, Nae Joung Kwak, Dong Jin Kwon, and Jae-Hyeong Ahn</i>	
Distributed Formation Control for Communication Relay with Positionless Flying Agents	18
<i>Kiwon Yeom</i>	
A Content-Based Caching Algorithm for Streaming Media Cache Servers in CDN	28
<i>Inwhee Joe, Ju Hoon Yi, and Kyu-Seek Sohn</i>	
Implementation of Bilinear Pairings over Elliptic Curves with Embedding Degree 24	37
<i>In Tae Kim, Chanil Park, Seong Oun Hwang, and Cheol-Min Park</i>	
Improvement of Mobile U-health Services System	44
<i>Byung-Won Min</i>	
Design and Implementation of an Objective-C Compiler for the Virtual Machine on Smart Phone	52
<i>YunSik Son and YangSun Lee</i>	
The Semantic Analysis Using Tree Transformation on the Objective-C Compiler	60
<i>YunSik Son and YangSun Lee</i>	
A Platform Mapping Engine for the WIPI-to-Windows Mobile Contents Converter	69
<i>YangSun Lee and YunSik Son</i>	
A Trading System for Bidding Multimedia Contents on Mobile Devices	79
<i>Young-Ho Park</i>	
Design of a Context-Aware Mobile System Using Sensors	89
<i>Yoon Bin Choi and Young-Ho Park</i>	