

Contents

PARS: 23rd PARS-Workshop on Parallel Systems and Algorithms

FULL PAPERS

Improved bitonic sorting by wire elimination	15
M. Mühlenthaler, R. Wanka, University of Erlangen-Nuremberg	
Parallel join processing on graphics processors for the resource description framework	23
J. Senn, University of Basel	
Modeling data distribution for two-phase flow problems by weighted graphs	31
O. Fortmeier, T. Henrich, H. M. Bücker, RWTH Aachen	
Distributed vision graph update in mobile vision networks	39
M. Wittke, J. Hähner, University of Hannover	
Routing based on evolved agents	45
P. Ediger, R. Hoffmann, TU Darmstadt	
A block device driver for parallel and fault-tolerant storage	55
O.-J. Frahm, P. Sobe, University of Lübeck	
Concepts and experiments for optimizing wide-input streaming CRC circuits	63
A. Döring, IBM Research Zurich	
Operating system processor scheduler design for future chip multiprocessor	69
T. C. Xu, A. W. Yin, P. Liljeberg, H. Tenhunen, University of Turku, Turku	
Evaluation and refinement of a tuning tool for grid applications	77
J. Keller, N. K. Nguyen, W. Schiffmann, FernUniversität in Hagen	
Platform-independent modeling of explicitly parallel programs	83
C. W. Kessler, W. Schamai, P. Fritzon, Linköping University	
Delivering guidance information in heterogeneous systems	95
F. Nowak, M. Kicherer, R. Buchty, W. Karl, Karlsruhe Institut of Technology	
QPACE: Energy-efficient high performance computing	103
S. Rinke, Research Center Jülich, H. Böttiger, B. Krill, IBM German Research	
High-level application design for hybrid computing systems	113
V. Hampel, E. Maehle, University of Lübeck	

SHORT PAPERS

A hybrid transport/control operation triggered architecture	121
N. Moser, S. Hauser, C. Gremzow, TU Berlin	

Structural aware quantitative interprocedural dataflow analysis	127
C. Grenzow, N. Moser, Berlin	
GPU-based parallel signature scanning and hash generation	133
B. Fechner, Fernuniversität in Hagen	

INVITED TALK

MPI for the future?	139
J. L. Träff, University of Vienna	

CoSDEO: Workshop on Context-Systems Design, Evaluation and Optimisation

Integrating Context Awareness with SOA: Case Studies for Service-oriented and Context-based Architectures	143
Raphael Zender, Ulrike Lucke, Djamshid Tavangarian, University of Rostock	

A Tool Chain for a Lightweight, Robust and Uncertainty-based Context Classification System (CCS)	151
Henning Günther, Firas El Simrany, Martin Berchtold, Michael Beigl, TU Braunschweig	

Recording a Complex, Multi Modal Activity Data Set for Context Recognition	161
P. Lukowicz, G. Pirkl, D. Bannach, University of Passau, F. Wagner, A. Calatroni, K. Förster, T. Holleczeck, M. Rossi, D. Roggen, G. Troester, ETH Zürich, J. Doppler, C. Holzmann, A. Riener, A. Ferscha, JKU Linz, R. Chavarriaga, EPFL Lausanne	

Activity Recognition Using Inertial Sensing for Healthcare, Wellbeing and Sports Applications: A Survey	167
Akin Avci, Stephan Bosch, Mihai Marin-Perianu, Raluca Marin-Perianu, Paul Havinga, University of Twente	

DAG Based Context Reasoning: Optimized DAG Creation	177
Niklas Klein, Kassel University, Stephan Sigg, TU Braunschweig, Klaus David, Kassel University, Michael Beigl, TU Braunschweig	

Trust as a Design Aspect of Context Aware Systems	183
Shakib Manouchehri, Matthias Söllner, Jan Marco Leimeister, Kassel University	

An Object-Oriented and Context-Aware Approach for Distributed Mobile Applications	191
Daniel Graff, TU Berlin, Matthias Werner, TU Chemnitz, Helge Parzyjegl, TU Berlin, Jan Richling, TU Berlin, Gero Mühl, University of Rostock	

WUPS: Workshop on Ultra-Low Power Sensor Networks

KEYNOTE

Batteries not Included – New Shoes or an Old Hat?	203
Tom Kazmierski, University of Southampton	

SESSION 1: Modelling and Simulation

- SystemC-AMS Models for Low-Power Heterogeneous Designs: Application to a WSN for the Detection of Seismic Perturbations** 205
Antoine Lévêque, François Pêcheux, Marie-Minerve Louërat, Hassan Aboushady, Michel Vasilevski, University Pierre & Marie Curie, Lip6 Laboratory
- Multilevel Sensor Node Simulation within a TLM-like Network Simulation Framework** 211
Joseph Wenninger, Markus Damm, Javier Moreno, Jan Haase, Christoph Grimm, Vienna University of Technology
- Analytical Modeling of Detection Capability in Ultra-Low Power Wireless Sensor Networks** 217
Paolo Medagliani and Gianluigi Ferrari, University of Parma, Vincent Gay, Jérémie Leguay, Mario Lopez-Ramos Thales Communications

SESSION 2: Design of Low-Power Systems

- Optimized Protocol Processing for a Low-Power Wireless Sensor Node** 223
Rainer Maticsek, Markus Dielacher, Martin Flatscher, Thomas Herndl, Josef Prainsack, Infineon Technologies Austria AG
- PowWow: Energy-efficient HW/SW Techniques for Wireless Sensor Networks**..... 229
Olivier Berder, Olivier Sentieys, University of Rennes
- A BAW-based Transceiver Used as Wake-Up Receiver** 235
Markus Dielacher, Josef Prainsack, Martin Flatscher, Rainer Maticsek, Thomas Herndl, Infineon Technologies Austria AG, Wolfgang Pribyl, Graz University of Technology
- A First Experimental Investigation of the Practical Efficiency of Battery Scheduling** 241
Damien Miliche, Maurits de Graaf, Gerard Hoekstra, Thales, Marijn Jongerden, Boudewijn Haverkort, CTIT, University of Twente

SESSION 3: Low-Power Approaches

- Dynamic Data Dissemination Techniques for WSN** 247
Zeeshan Ali Khan, Cecile Belleudy, Michel Auguin, University of Nice-Sophia Antipolis
- Routing Versus Energy Optimization in a Linear Network**..... 253
Tom Coenen, University of Twente, The Netherlands, Maurits de Graaf, Thales Land and Joint Systems, Jan-Kees van Ommeren, University of Twente
- Energy Consumption Estimation and Profiling in Wireless Sensor Networks** 259
Javier Moreno, Jan Haase, Christoph Grimm, Vienna University of Technology, Austria
- Long-duration Reliability Tests of Low Power Wireless Sensing and Control Links in an Office Environment** 265
Dr. Ir. Koen Holtman, Philips Applied Technologies, Eindhoven, The Netherlands

PARMA: Workshop on Parallel Programming and Run-time Management Techniques for Many-core Architectures

SESSION 1: Programming models and languages, compilers and virtualization techniques

Improved Programming of GPU Architectures through Automated Data Allocation and Loop Restructuring 271
Andrea Di Biagio, Giovanni Agosta, Politecnico di Milano

Extending a Light-weight Runtime System by Dynamic Instrumentation for Performance Evaluation 279
Mario Kicherer, Fabian Nowak, Rainer Buchty, Wolfgang Karl, Karlsruhe Institute of Technology

Parallelism and Retargetability in the ILDJIT Dynamic Compiler 285
Michele Tartara, Simone Campanoni, Giovanni Agosta, Stefano Crespi Reghizzi, Politecnico di Milano

SESSION 2: Runtime management, power management and memory management

CPM: A Cross-Layer Framework to Efficiently Support Distributed Resources Management 293
Patrick Bellasi, Stefano Bosisio, Matteo Carnevali, William Fornaciari Politecnico di Milano, David Siorpaes, STMicroelectronics

An Efficient Run-Time Management Methodology for a Stereo Matching Application..... 299
Giovanni Mariani, University of Lugano, Chantal Ykman-Couvreur, Ke Zhang, Lu Zhang, Gauthier Lafruit IMEC

Dynamic Frequency Scaling for MPSoCs-based on Chaotic Workload Analysis 305
Nikolaos Zompakis, National Technical University of Athens, Vasileios Tsoutsouras, Democritus University of Thrace, Alexandros Bartzas, National Technical University of Athens, Dimitrios Soudris, National Technical University of Athens, Georgios Pavlos, Democritus University of Thrace

SESSION 3: Design space exploration and many-core architecture customization

Modeling Separate Memory Spaces in Native Co-simulation with SystemC for Design Space Exploration 313
Hector Posadas, University of Cantabria, Santander, Eugenio Villar, University of Cantabria, Santander

Fast Design Space Exploration Environment Applied on NoC's for 3D-Stacked MPSoC's 319
Alienor Richard, Dragomir Milojevic, Frederic Robert, Bio Electro and Mechanical Systems, Université Libre de Bruxelles, Alexandros Bartzas, Antonis Papanikolaou, Kostas Siozios, Dimitrios Soudris, National Technical University of Athens

Multicube Explorer: An Open Source Framework for Design Space Exploration of Chip Multi-Processors 325
V. Zaccaria, G. Palermo, F. Castro, C. Silvano, Politecnico di Milano, G. Mariani, University of Lugano

GI/ITG: Workshop on Energy-aware Systems and Methods

Plea for a Holistic Analysis of the Relationship between Information Technology and Carbon-Dioxide Emissions	335
Peter Marwedel, Michael Engel, TU Dortmund	
Distributed Energy Measurements in WSN Testbeds with a Sensor Node Management Device (SNMD)	341
Anton Hergenröder, Joachim Wilke, Detlev Meier, Karlsruhe Institute of Technology	
CapLibrate: Self-Calibration of an Energy Harvesting Power Supply with Supercapacitors	349
Christian Renner and Volker Turau, Hamburg University of Technology	
Redundancy Aware Clustering via Centroid Localization Technique	359
Jakob Salzmann, Ralf Behnke, Dirk Timmermann, University of Rostock	
A Scheduling Approach for Efficient Utilization of Hardware-Driven Frequency Scaling	367
Jan H. Schönherr, Jan Richling, Technische Universität Berlin, Gero Mühl, University of Rostock, Matthias Werner, Chemnitz University of Technology	
Towards Power Consumption Reduction by User Behavior Monitoring at Application Level	377
Imran Asad Gul, Universität Oldenburg, Wilhelm Hasselbring, Universität Kiel	
Promoting Power to a First Class Metric in Network Simulations	387
Muhammad Hamad Alizai, Georg Kunz, Olaf Landsiedel, Klaus Wehrle, RWTH Aachen University	
Customized Duty Cycling with MacZ	393
Martin Winkler, Dennis Christmann, Marc Krämer, University of Kaiserslautern	
Energieeffizientes Handover-Management für heterogene Netzwerke	403
Mario Pink, Universität Cottbus	