The 13th IEEE International Conference on
Embedded and Real-Time Computing Systems and Applications (RTCSA 2007)

21-23 August, 2007
Hotel Inter-Bulgo, Daegu, Korea

**Final Program**

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Organized by Advanced Information Technology Research Center, Korea

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**Tuesday August 21, 2007**

**08:30 – 10:00**  **Welcome Notes and Keynote I**

*It is a Small, Flat World*

*C. L. Liu, National Tsing Hua University, Hsinchu, Taiwan*

**10:00 – 10:30**  **Break**

**10:30 – 12:00**  **Session 1: Resource Sharing**

*Contract-Based Reusable Worst-Case Execution Time Estimate*

*Johan Fredriksson, Thomas Nolte, Mikael Nolin, and Heinz Schmidt*

*A Flexible Real-Time Locking Protocol for Multiprocessors*

*Aaron Block, Hennadiy Leontyev, Bjorn Brandenburg, and James Anderson*

*Efficiently Accessing Remote Resources in Distributed Real-Time Systems*

*Paul Usher and Neil Audsley*

*Exact Analysis of TDMA with Slot Skipping*

*Nuno Pereira, Eduardo Tovar, and Bjorn Andersson*

**10:30 – 12:00**  **Session 2: Memory Management for Embedded Applications**

*Semi-Automatic Region-Based Memory Management for Real-Time Java Embedded Systems*

*Guillaume Salagrac, Christophe Rippert, and Sergio Yovine*

*An Efficient Page Lock/Release OS Mechanism for Out-of-Core Embedded Applications*

*Ameet Patil and Neil Audsley*

*A Study on the Packaging for Fast Boot-up Time in the Embedded Linux*

*Kyung Ho Chung, Myung Sil Choi, and Kwang Seon Ahn*

*A NOR Emulation Strategy over NAND Flash Memory*

*Jian-Hong Lin, Yuan-Hao Chang, Jen-Wei Hisieh, and Tei-Wei Kuo*

**12:00 – 13:30**  **Lunch**
13:30 – 15:00  Session 3: Multiprocessor Scheduling

Tardiness Bounds for EDF Scheduling on Multi-Speed Multicore Platforms
Hennadiy Leontyev and James Anderson

Competitive Analysis of Static-Priority Partitioned Scheduling on Uniform Multiprocessors
Bjorn Andersson and Eduardo Tovar

Current Results on EDZL Scheduling for Multiprocessor Real-Time Systems
Hsin-Wen Wei, Yi-Hsiung Chao, Shun-Shii Lin, Kwei-Jay Lin, and Wei-Kuan Shih

13:30 – 15:00  Session 4: Ubiquitous Wireless Networks

Wireless LAN Positioning based on Received Signal Strength from Mobile device and Access Points
Wilson Yeung and Joseph Ng

A Continuous Query Index for Processing Queries on RFID Data Stream
Jaekwan Park, Bonghee Hong, and Chaehoon Ban

A Dynamic Medial Axis Model for Sensor Networks
Lan Lin and Hyunyoung Lee

15:00 – 15:30  Break

15:30 – 17:00  Session 5: Analysis and Design I

An Approach to the Timing Analysis of Hierarchical Systems
Marco Panunzio and Tullio Vardanega

On Verification of Probabilistic Timed Automata against Probabilistic Duration Properties
Hung Dang Van and Miaomiao Zhang

Real-time Connectors for Deterministic Data-flow
Irfan Hamid and Elie Najm

15:30 – 17:00  Session 6: Advanced Embedded System Design Frameworks

Buffer Size Reduction through Control-Flow Decomposition
Youngchul Cho, Nacer-Eddine Zergainoh, Ahmed A. Jerraya, and Kiyoung Choi

A Time-Triggered Distributed Object Computing Environment for Embedded Control Systems
Tasuku Ishigooka and Takanori Yokoyama

COMDES-II: A Component-Based Framework for Generative Development of Distributed Real-Time Control Systems
Ke Xu, Krzysztof Sierszecki, and Christo Angelov

19:00 – 21:00  Reception

URL: http://www.rtcsa.org/program.htm

Wednesday August 22, 2007

08:30 – 10:00  Session 7: Analysis and Design II

Interactive Back-annotation of Worst-case Execution Time Analysis for Java Microprocessors
Trevor Harmon and Raymond Klefstad

Modeling Real-time Garbage Collection Cost
Wei Fu and Carl Hauser

Towards a Test Purpose Algorithm for an Automated Test Generation with Delayed Transitions to Timed Systems
Elisangela Vieira and Ana Cavalli

Multiform time in UML for Real-Time Embedded applications
Charles Andre, Frederic Mallet, and Marie-Agnes Peraldi-Frati

08:30 – 10:00  Session 8: Middleware for Ubiquitous Computing

MB++: An Integrated Architecture for Pervasive Computing and High-Performance Computing
David Lillethun, David Hilley, Seth Horrigan, and Umakishore Ramachandran

MobiGo: A Middleware for Seamless Mobility
Xiang Song and Umakishore Ramachandran

Lifestyle Ubiquitous Gaming: Making Daily Lives More Pleasurable
Tatsuo Nakajima

10:00 – 10:30  Break

10:30 – 12:00  Session 9: Networking and Distributed Systems

Networked Control Systems : Definition and Analysis of a Hybrid Priority Scheme for the Message Scheduling
Guy Juanole and Gerard Mounay

TERCOS: A Novel Technique for Exploiting Redundancy in Fault-Tolerant and Real-Time Distributed Systems
Yang fumin and Pang liping

Fast Recovery and QoS Assurance in the Presence of Network Faults for Mission-Critical Applications in Hostile Environments
Shrirang Gadgil, Balakrishnan Dasarathy, Frederick Porter, Kirthika Parmeswaran, and Ravi Vaidyanathan
10:30 – 12:00 Session 10: Power-Aware Design Methodologies
Preemption Control for Energy-Efficient Task Scheduling in Systems with a DVS Processor and Non-DVS Devices
Chuan-Yue Yang, Jian-Jia Chen, and Tei-Wei Kuo
Critical-Path based Low-Energy Scheduling Algorithms for Body Area Network Systems
Yan Hong Liu, Bharadwaj Veeravalli, and Sivakumar Viswanathan
Design of Low Power MAC Operator with Dual Precision Mode
Young-Geun Lee, Joo-Yul Park, and Ki-Seok Chung

12:00 – 13:00 Lunch

13:00 – 15:00 Invited Session
Achieving Predictable Performance with On-Chip Shared L2 Caches for Manycore-Based Real-Time Systems
Sangyeun Cho, Lei Jin, and Kiyeon Lee
Real-Time Loop Scheduling with Leakage Energy Minimization for Embedded VLIW DSP Processors
Meng Wang, Zhi Shao, Chun Xue, and Edwin H.-M. Sha
A Voltage and Resource Synthesis Technique for Energy-Aware Real-time Systems
Dong-In Kang, Stephen P. Crago, Jinwoo Suh, and Janice McMahon
Energy-Efficient Scheduling for Real-Time Systems on Dynamic Voltage Scaling (DVS) Platforms
Jian-Jia Chen and Chin-Fu Kuo

15:00 – 15:30 Break

15:30 – 17:00 Session 11: Databases
A Real-Time Database Testbed and Performance Evaluation
Kyoung-Don Kang, Phillip Sin, Jisu Oh, and Sang Son
Virtual Full Replication by Adaptive Segmentation
Gunnar Mathiasson, Sten F. Andler, and Sang H. Son
Performance Evaluations and Estimations of Workload of On-Demand Updates in Soft Real-Time Systems
Thomas Gustafsson and Jorgen Hansson

15:30 – 17:00 Session 12: Wireless Sensor Networks
Lightweight Distributed Topology Control Algorithms for Heterogeneous Wireless Sensor Networks
Jun Wu, Han-Chi Lin, and Yung-Feng Lu
Clock Free Data Streams Alignment for Sensor Networks
Guo-Liang Li and Chi-Sheng Shih
Remote Controlled Group Behavior for Widely Spread and Cooperative Mobile Robots in Wireless Sensor Network Environment
Laxmisha Rai and Soon Ju Kang
A Physical Activities Healthcare System Based on Wireless Sensing Technology
Zhi Li and Guanglie Zhang

19:00 – 29:30 Banquet and Welcome Note
Dr. Kyusuk Chung
President of DGIST

19:30 – 21:30 Keynote II
Technology Trends in Consumer Electronics Software
Dr. Jong-Deok Choi
Sr. Vice-President, Digital Media Business, Samsung Electronics

URL: http://www.rtcsa.org/program.htm

Thursday August 23, 2007

08:00 – 10:15 Session 13: Uniprocessor Scheduling and Analysis
Parametric Polynomial-time Algorithms for Computing Response-time bounds for static-priority tasks with release jitters
Nahan Fisher, Chau Huyen Nguyen, Joel Goossens, and Pascal Richard
Scheduling Algorithms for I/O Blockings with a Multi-frame Task Model
Shan Ding, Hiroyuki Tomiyama, and Hiroaki Takada
Relationships between Window-based Real-time Constraints
TU Gang, CAO Wan-hua, and YANG Fu-min
Fast Schedulability Analysis Using Commodity Graphics Hardware
Jimin Feng, Samirjit Chakraborty, Bertil Schmidt, Weiguuo Liu, and Unmesh Bordoloi
Multi-Speed DVS Algorithms for Periodic Tasks with Non-Preemptible Sections
Jaewoo Lee, Kern Koh, and Chang-Gun Lee
Real-Time Control and Scheduling Co-Design for Efficient Jitter Handling
Moris Behnam and Damir Isovic
### Session 14: Compiler Techniques and SoC Designs

- **Code Size Optimization for Embedded Processors using Commutative Transformations**  
  Sai Pinnepalli, Jinpyo Hong, J. Ramanujam, and Doris Carver
- **Securing More Registers with Reduced Instruction Encoding Architectures**  
  Je-Hyung Lee, Jinpyo Park, and Soo-Mook Moon
- **Temperature-Aware Compilation for VLIW Processors**  
  Benjamin Schafer, Yongho Lee, and Taewhan Kim
- **A Deterministic Implementation Process for Accurate and Traceable System Timing and Space Analysis**  
  Michael Ward and Neil Audsley
- **Cache Organizations for H.264/AVC Motion Compensation**  
  Ju-Hyun Kim, Gyoung-Hwan Hyun, and Hyuk-Jae Lee
- **Template-based Runtime Reconfiguration Scheduling for Partial Reconfigurable SoC**  
  Chia Li and Chi-Sheng Shih

### Session 15: Scheduling, Analysis, and MISC

- **Real-Time Scheduling with Task Splitting on Multiprocessors**  
  Shinpei Kato and Nobuyuki Yamasaki
- **FL-PCP: Frequency Locking for Energy-Efficient Real-Time Task Synchronization**  
  Ya-Shu Chen, Chuan-Yue Yang, and Tei-Wei Kuo
- **Bringing Worst Case Execution Time Awareness to an Open Smart Card OS**  
  Nadia Bel Hadj Aissa, Gilles Grimaud, and Vincent Benony
- **CENTURY: Automated Aspects of Patient Care**  
  Marion Blount, John Davis, Andrew Kim, Archan Misra, Sehun Park, Daby Sow, Young Ju Tak, Min Wang, Karen Witting, and Ji Hyun Kim
- **Analyzing Access Timing of Removable Flash Media**  
  Daniel Parthey and Robert Baumgartl

### Session 16: Context Awareness and Privacy, and System Performance

- **Activity Recognition Based on Semi-supervised Learning**  
  Donghai Guan and Weiwei Yuan
- **ID Prediction Algorithm for Tag Collision Arbitration in RFID System**  
  Hyun Jun Yeo, Yong Hwan Kim, and Kwang Seon Ahn
- **A Privacy Preserving Access Control Scheme using Anonymous Identification for Ubiquitous Environments**  
  Diep Nguyen Ngoc, Sungyoung Lee, Young-Koo Lee, and HeeJo Lee
- **An MPSoC Performance Estimation Framework Using Transaction Level Modeling**  
  Rabie Ben Atitallah, Smail Niar, Samy Meftali, and Jean-Luc Dekeyser
- **Activity-based Access Control Model to Hospital Information**  
  Hung Le Xuan, Sungyoung Lee, Young-Koo Lee, and Heejo Lee
- **Preventing network performance interference with ACK-separation queuing mechanism in a home network gateway using an asymmetric link**  
  Jiyong Park and Seongsoo Hong

### Tutorial: AUTOSAR - An Open Standardized Software Architecture for Automotive Industry (Part I)

- **Abstract**  
  Complexity of Automotive E/E Architecture is increasing year by year, and AUTOSAR has been founded to solve this issue. This lecture provides information of AUTOSAR's engineering approaches to Automotive E/E Architecture. Contents are as follows.
  
  1. Automotive systems and software engineering
  2. AUTOSAR project overview
  3. Anticipated use cases of AUTOSAR results
  4. Main concepts: methodology and templates
  5. Main concepts: Functional interfaces
  6. Main concepts: basic software and RTE(real time environment)
  7. AUTOSAR current status

- **Speaker Name**  
  Kenji Nishikawa
  
  General Manager Electronics Engineering Div.2 Toyota Motor Europe NV/SA

### Tutorial: AUTOSAR - An Open Standardized Software Architecture for Automotive Industry (Part II)

- **URL:** [http://www.rtcsoa.org/program.htm](http://www.rtcsoa.org/program.htm)