# Table of Contents

**Message from the PDCAT 2010 Steering Chairs and General Co-Chairs** ................................................................. xiii
**Message from the PDCAT 2010 Program Co-Chairs** .................................................................................................... xiv
**PDCAT 2010 Conference Committee** ..................................................................................................................... xv
**Message from the PDCAT 2010 Workshop Co-Chairs** ................................................................................................... xvi
**Message from the NSC 2010 Workshop Co-Chairs** ..................................................................................................... xvii
**NSC 2010 Workshop Organizing and Program Committees** ..................................................................................... xviii
**Message from the ENC 2010 Workshop Co-Chairs** ...................................................................................................... xix
**ENC 2010 Workshop Organizing and Program Committees** ....................................................................................... xx

## Full Papers

### Session 1: Networking, Distributed Systems, and Applications

**Commit Protocols for a Distributed Transactional Memory** ..................................................................................... 1
  *Marc-Florian Müller, Kim-Thomas Möller, and Michael Schöttner*

**A Feature-Based Replica Consistency Strategy for Spatial Data in Distributed GIS** ................................................................. 11
  *Hong Liang, Judong Wei, Yongshan Xing, and Jun Wu*

**Integrating DBMSs as a Read-Only Execution Layer into Hadoop** ............................................................................. 17
  *Mingyuan An, Yang Wang, Weiping Wang, and Ninghui Sun*
Multi-aggregate-query Scheduling over Data Streams ................................................................. 27
   Tao Chen, Nong Xiao, and Fang Liu

Rawls Scheduler: Load Considered Proportional Share Scheduling for High
Performance Multimedia Systems .................................................................................................. 34
   Jeong-Joon Yoo, Seung-Won Lee, and Shi-Hwa Lee

SemanticCast: Content-Based Data Distribution over Self-Organizing
Semantic Overlay Networks .......................................................................................................... 42
   Zhong Zheng and Yijie Wang

ADREA: A Framework for Adaptive Resource Allocation in Distributed
Computing Systems ......................................................................................................................... 50
   Masnida Hussin, Young Choon Lee, and Albert Y. Zomaya

Sharing In-Memory Game States .................................................................................................. 58
   Michael Sonnenfroh, Tobias Bæuerle, Peter Schulthess, and Michael Schättner

Distributed Popularity Based Replica Placement in Data Grid Environments ................................. 66
   Mohammad Shorfuzzaman, Peter Graham, and Rasit Eskicioglu

A Sink-Oriented Layered Clustering Protocol for Wireless Sensor Networks ................................ 78
   Bang Wang, Hock Beng Lim, Di Ma, and Daiqin Yang

A New Reliable and Self-Stabilizing Data Fusion Scheme in Unsafe Wireless
Sensor Networks ............................................................................................................................... 87
   Jacques M. Bahi, Mohammed Haddad, Mourad Hakem, and Hamamache Kheddouci

Session 2: Algorithms and Applications

A Deadline-Aware Concurrency Control Scheme for Composite Services .................................. 94
   Xinfeng Ye

Embedding a k-D Torus into a Locally Twisted Cube ................................................................. 104
   Chia-Jui Lai, Chang-Hsiung Tsai, and Tseng-Kui Li

Parallel Sorting on Recursive Dual-Nets .......................................................................................110
   Yamin Li, Shietung Peng, and Wanming Chu

An Adaptive Timeout Strategy for UDP Flows Using SVMs ..................................................... 118
   Jing Cai, Zhibin Zhang, Peng Zhang, and Xinbo Song
Set-to-Set Disjoint-Path Routing in Metacube ................................................................. 128
  Shietung Peng and Keichi Kaneko

Maotai 3.0: Automatic Detection of View Access in VOPP .................................................. 138
  K. Leung and Z. Huang

An Innovative Hybrid P2P Location Network for Distributed Optimal Path Planning .................. 148
  Lei Gao and Guangzhou Zeng

An Effective Congestion-Aware Selection Function for Adaptive Routing in Interconnection Networks ................................................................. 156
  Yanbin Lin and Dong Xiang

On Identity Disclosure in Weighted Graphs .................................................................................. 166
  Yidong Li and Hong Shen

Session 3: Architecture, Virtualization, and GPU

A Virtual Storage System Building on IP Networks .................................................................. 175
  Meng Xiao-xuan, Liu Zhen-han, Si Cheng-xiang, Na Wen-wu, Ke Jian, Zhu Xu-dong,
  Bu Qing-zhong, and Xu Lu

Scheduling Parallel Tasks on Multicore Nodes for Energy Saving .............................................. 183
  J. Mair, K. Leung, and Z. Huang

XenHVMAcct: Accurate CPU Time Accounting for Hardware-Assisted Virtual Machine ............... 191
  Huacai Chen, Hai Jin, and Kan Hu

Virtual Machine Management Based on Agent Service ............................................................ 199
  Song Wu, Li Deng, Hai Jin, Xuanhua Shi, Yankun Zhao, Wei Gao, Jianyin Zhang,
  and Jin Peng

MirageIO: High-Performance Virtual Block Devices in Xen ....................................................... 205
  YaJun Yang, Ying Song, Yaqiong Li, and Zhao YiQiang

Xen Live Migration with Slowdown Scheduling Algorithm ......................................................... 215
  Zhaobin Liu, Wenyu Qu, Weijiang Liu, and Keqiu Li
Session 4: Security, Fault Tolerance, and Reliability

Rainbow: A Robust and Versatile Measurement Tool for Kademlia-Based DHT Networks ................................................................. 222
  Xiangtao Liu, Tao Meng, Kai Cai, and Xueqi Cheng

A New Fault-Tolerant Routing Methodology on 2-D Mesh Networks-on-Chip Based on Construction of Convex and Concave Fault Regions ........................................................................... 229
  F. Safaei and A. Mortazavi

A Skeletal-Based Approach for the Development of Fault-Tolerant SPMD Applications ...................................................................................... 239
  Constantinos Makassikis, Virginie Galtier, and Stéphane Vialle

Short Papers

Session 1: Networking, Distributed Systems, and Applications

An Efficient Data Service Layer ........................................................................................................................................................................ 249
  Rui Yin and Xinfeng Ye

Decentralized Orchestration with Local Centralized Orchestration for Composite Web Services ........................................................................ 255
  Xi Chen, Huaxin Zeng, and Tao Wu

HPP Controller: A System Controller Dedicated for Message Passing ........................................................................................................ 261
  Kai Wang, Fei Chen, Zheng Cao, Xuejun An, and Ninghui Sun

A Novel Model and a Simulation Tool for Churn of P2P Network ............................................................................................................... 267
  Qiuming Luo, Yun Li, Wentao Dong, Gang Liu, and Rui Mao

Modeling Overall Energy Consumption in Wireless Sensor Networks ......................................................................................................... 273
  Najmeh Kamyabpour and Doan B. Hoang

Game Theory Used for Reliable Routing Modeling in Wireless Sensor Networks ............................................................................................. 280
  Minghui Zheng

MMRL: Mobile Max Rectangle Localization Scheme for Large Scale Wireless Sensor Network ............................................................................... 285
  Baoli Zhang and Fengqi Yu
Reliable Multi-path Routing Protocol in Wireless Sensor Networks .................................................. 289  
Xin-hua Wang, Chang-ming Che, and Ling Li

A Distributed Video-on-Demand System Based on Cloud Computing .................................................. 295  
Chang Shu and Xingming Zhang

Session 2: Algorithms and Applications

The Diagnosability of Augmented Cubes under PMC Model ................................................................. 301  
Li Jun and Tan Xuegong

Architecture of BulaPay - A Web-Service Based Third-Party Payment System .................................. 305  
Weiqiang Liang and Xiaoling Dai

Scheduling of a Relaxed Backfill Strategy with Multiple Reservations ............................................... 311  
Bo Li, Ying Li, Min He, Hao Wu, and Jundong Yang

Parallel Point-Addition and Point-Double for Cryptosystem on Conic Curves  
over Ring Zn ............................................................................................................................................. 317  
Yongnan Li, Limin Xiao, Aihua Liang, and Zifeng Wang

Design and Implementation of Service Composition Protocol Based on DSR .................................... 323  
Songqiao Han and Yong Zhang

Hamiltonian Cycle Embedding in Hierarchical Crossed Cubes .......................................................... 329  
Pao-Lien Lai, Chang-Hsiung Tsai, and Hong-Chun Hsu

Systematic Development of Correct Bulk Synchronous Parallel Programs ........................................... 334  
Louis Gesbert, Zhenjiang Hu, Frédéric Loulergue, Kiminori Matsuzaki, and Julien Tesson

A Random Heuristic for Message Broadcasting in Arbitrary Networks ................................................. 341  
Hovhannes A. Harutyunyan and Wei Wang

Multiple Search Centers Based Fast Motion Estimation Algorithm  
for H.264/AVC ........................................................................................................................................ 346  
Huitao Gu, Shuming Chen, Shuwei Sun, Shenggang Chen, and Xiaowen Chen

Evaluating the Performance of Software-Based Routing Algorithms  
for Dynamic Fault Tolerance in Tori ........................................................................................................ 351  
M. ValadBeigi, F. Safaei, and A. Mortazavi
Session 3: Architecture, Virtualization, and GPU

Transient Congestion Avoidance in Software Distributed Shared Memory Systems ................................................................. 357

On Parallel Stiff ODEs Solver for Hybrid CPU-GPU Architecture ................................................................. 365
Shuming Miao, Verdi March, Xinhua Lin, Simon Chong Wee See, and Hong Liu

Experiences with Hierarchical Storage Management Support in Blue Whale File System ......................................................... 369
Hongyuan Ma, Zhenjun Liu, Huan Zhang, Shuo Feng, Xiaoming Han, and Lu Xu

Performance Models for Matrix Computations on Multicore Processors Using OpenMP ......................................................... 375
Panagiotis D. Michailidis and Konstantinos G. Margaritis

Energy-Efficient Task Clustering Scheduling on Homogeneous Clusters ................................................................. 381
Wei Liu, Hongfeng Li, and Feiyan Shi

A Platform-Centric Framework for the Web Exposure and Orchestration of Distributed Objects ......................................................... 386
Hervé Paulino, Paulo Cancela, and Tiago Franco

First International Workshop on Network and Service Computing (NSC 2010)

Insecure JavaScript Detection and Analysis with Browser-Enforced Embedded Rules ................................................................. 393
Ping Zeng, Jianhua Sun, and Hao Chen

A New Database Firewall Based on Anomaly Detection ................................................................. 399
Jianhua Sun, Hao Chen, and Chunmei Niu

A Framework for Recommendation and Trust Assessment in SNS ................................................................. 405
Rui Zhang and Binbin Qu

SRCS: Multi-user Web Browser Sharing and Collaboration System ................................................................. 410
Gaoyi Peng, Jianhua Sun, and Hao Chen
A Study and Design of Multi-node Tamper-Resistant Web System Based on Ring Structure ................................................................. 416
   Guo-yun Duan

Cognition and Culture in ICT Experience .......................................................................................................................... 420
   Jue Zhao, Sheng Zhang, and Weiwei Tan

Research of Security Strategies for a Novel Ad Hoc Network ................................................................. 426
   Chun-sheng Wen

An Optimization of the Loading Balance Technology in the WebGIS ................................................................. 430
   Sheng Zhang, Shu Chen, and Jue Zhao

The Generation of Attack Signatures Based on Virtual Honeypots ................................................................. 435
   Xinyu Tang

FACRA: Flexible-Core Architecture Chip Resource Abstractor ................................................................................. 440
   Tao Sun, Hong An, Yongqing Ren, Mengjie Mao, Yang Liu, Mu Xu, and Qi Li

Formal Discussion on Relationship between Virtualization and Cloud Computing ................................................................. 448
   Hanfei Dong, Qinfen Hao, Tiegang Zhang, and Bing Zhang

The Research of Distributed Object State Management Mechanism Based on CORBA ................................................................. 454
   Xinghui Zhu and Kui Fang

Simulation System of Earthquake Precursory Observatory Equipment Based on STM ................................................................. 458
   Weifeng Shan and Husheng Liao

First International Workshop on Engineering and Numerical Computation (ENC 2010)

Two-Dimensional Dam-Break Flood Simulation on Unstructured Meshes ................................................................. 465
   Lixiang Song, Jianzhong Zhou, Qiang Zou, Jun Guo, and Yi Liu

Recording Performance Analysis of Pre-patterned-deposition Bit Patterned Media through Micromagnetic Simulation ................................................................. 470
   Shu Xu, Jie Liu, Jincai Chen, and Gongye Zhou
Numerical Analysis of S-Shape Curved Continuous Rigid-Frame Bridges with High Piers under Earthquakes ................................................................. 474
Yunjie Dai and Hongping Zhu

A Meshless Method for the Reconstruction of the Shape .............................................. 479
Jun-Jie Wang, Hong-bin Dai, and Lian-Tang Wang

Thermal Performance Analysis of the Lithium-Ion Batteries ........................................ 483
Mao-de Li and Feng Wang

CUDA Based Fast Implementation of Very Large Matrix Computation .......................... 487
Yinghong Sun and Yuanman Tong

A Composite Boyer-Moore Algorithm for the String Matching Problem ........................ 492
Zhengda Xiong

A Stealthy Path Planning Method for Aircraft by Constant Azimuth ................................ 497
Ling-Xiao Wang, De-Yun Zhou, and Rui Zheng

Container Cranes Response Predict on Seismic Load ......................................................... 504
Pei Zheng, Qin Zhang, and Xianrong Qin

Analytical Solutions for Long Waves Scattering by a Circular Cylinder Mounted on a General Shoal ................................................................. 509
Jian-Jian Xie and Huan-Wen Liu

Analysis of Parallel Computing Environment Overhead of OpenMP for Loop with Multi-core Processors ................................................................. 514
Wan-Qing Li, Tang Ying, Yunfa Li, Zhang Wei, Jangcong Feng, and Zhang Jilin

A Control Mechanism about Quality of Service for Resource Scheduling in Multiple Virtual Machine System ......................................................... 518
Yunfa Li, Xiangha Xu, Jian Wan, and Wanqing Li

Author Index ..................................................................................................................... 524