

Proceedings

# 2008 International Symposium on Applications and the Internet **SAINT 2008**

28 July - 1 August 2008  
Turku, Finland

Co-sponsored by  
IEEE Computer Society (IEEE-CS)  
Information Processing Society of Japan (IPSJ)



The SAINT 2008 organizers would like to thank the following  
Platinum Supporter



Los Alamitos, California  
Washington • Tokyo



# **International Symposium on Applications and the Internet**

# **SAINT 2008**

## **Table of Contents**

**Message from the General Chairs**

**Message from the Program Committee Chair**

**Organizing Committee**

**Program Committee**

**Steering Committee**

**Workshops Program Welcome Message**

**Message from the Organizers of the Second  
International Workshop on SensorWebs,  
Databases and Mining in Networked Sensing  
Systems (SWDMNSS)**

**Message from the Organizers of the Third  
International Workshop on Dependable  
and Sustainable Peer-to-Peer Systems (DAS-P2P  
2008)**

**Organizers' Welcome for the Workshop on Heuristic  
Methods for the Design, Deployment,  
and Reliability of Networks and Network  
Applications (HEUNET 2008)**

**Message from the Organizers of the Workshop  
on Middleware Architecture in the Internet (Mid  
Arch 2008)**

**Message from the Organizers of the Workshop  
on Social and Personal Computing  
for Web-Supported Learning Communities (SPeL  
2008)**

**Message from Organizer of Workshop  
for Ubiquitous Networking and Enablers  
to Context-Aware Services (UNECAS)**

**Message from the Organizers of the Workshop  
on Power Consumptions in Future Network  
Systems (PCFNS)**

**Message from Organizers of the Second  
International Workshop on Practical Applications  
of Sensor Networking (PASN)**

**Workshop on IT Enabled Services (ITeS)**

**Message from the Organizers of the Workshop  
on Next Generation Service Platforms for Future  
Mobile Systems (NGSP-FMS)**

---

## **Session 1: Network Architecture and Performance**

Performance Measurements and Statistics of Tor Hidden Services .....	1
<i>Karsten Loesing, Werner Sandmann, Christian Wilms, and Guido Wirtz</i>	
Dynamic Relay Node Placement in Wireless Sensor Networks .....	8
<i>Jorge Mena and Vana Kalogeraki</i>	
DHT Network with Link Access Control Using a Social Network .....	18
<i>Kimihiko Ando, Atsuo Fukagai, Kohta Ohshima, and Matsuaki Terada</i>	

## **Session 2: Web Services**

Semantic Web Services Discovery by Matching Temporal Restrictions .....	26
<i>Cássio V. S. Prazeres, Cesar A. C. Teixeira, and Maria da Graça C. Pimentel</i>	
On the Enhancement of BPEL Engines for Self-Healing Composite Web Services .....	33
<i>Sattanathan Subramanian, Philippe Thiran, Nanjangud C. Narendra, Ghita Kouadri Mostefaoui, and Zakaria Maamar</i>	
A Web Service Communication Policy for Describing Non-standard Application Requirements .....	40
<i>Steffen Heinzl, Markus Mathes, and Bernd Freisleben</i>	

## Session 3: Security 1

ROOK: Multi-session Based Network Security Event Detector .....	48
<i>Masayoshi Mizutani, Shin Shirahata, Masaki Minami, and Jun Murai</i>	
A Generalized Feature Extraction Scheme to Detect 0-Day Attacks via IDS Alerts .....	55
<i>Jungsuk Song, Hiroki Takakura, and Yongjin Kwon</i>	
Function Call Mechanism Based Executable Code Detection for the Network Security .....	62
<i>Daewon Kim, Yangseo Choi, Ikkyun Kim, Jintae Oh, and Jongsoo Jang</i>	

## Session 4: Security 2

Extracting Worm-Infected Hosts Using White List .....	68
<i>Noriaki Kamiyama, Tatsuya Mori, Ryoichi Kawahara, Shigeaki Harada, and Hideaki Yoshino</i>	
Manager-Based Architecture in Ad Hoc Network Intrusion Detection System for Fast Detection Time .....	76
<i>Muhammad Arifin Ritonga and Masaya Nakayama</i>	
Secure Framework for Integrated Multipath MANET with Internet .....	83
<i>Binod Vaidya, Jae-Young Pyun, Sungbum Pan, and Nak-Yong Ko</i>	

## Session 5: Search and Verification

Tiny LSH for Content-Based Copied Video Detection .....	89
<i>Kenichi Yoshida and Noboru Murabayashi</i>	
Efficient Information Searching Methods Based on User Utility in Super Distributed Environments .....	96
<i>Shinji Sugawara, Hiroyuki Ohnishi, and Yutaka Ishibashi</i>	
An Abstract Generic Framework for Web Site Verification .....	104
<i>M. Alpuente, P. Ojeda, D. Romero, D. Ballis, and M. Falaschi</i>	

## Session 6: Collaboration

Huffman-DHT: Index Structure Refinement Scheme for P2P Information Retrieval .....	111
<i>Hisashi Kurasawa, Atsuhiko Takasu, and Jun Adachi</i>	
inContext: A Pervasive and Collaborative Working Environment for Emerging Team Forms .....	118
<i>Hong-Linh Truong, Schahram Dustdar, Dino Baggio, Stephane Corlosquet, Christoph Dorn, Giovanni Giuliani, Robert Gombotz, Yi Hong, Pete Kendal, Christian Melchiorre, Sarit Moretzky, Sebastien Peray, Axel Polleres, Stephan Reiff-Marganiec, Daniel Schall, Simona Stringa, Marcel Tilly, and HongQing Yu</i>	
Group-Based Image Retrieval Method for Video Annotation .....	126
<i>Noboru Murabayashi, Setsuya Kurahashi, and Kenichi Yoshida</i>	

# International Symposium on Applications and the Internet Workshops (SAINT 2008 Workshops)

## The 2nd International Workshop on SensorWebs, Databases and Mining in Networked Sensing Systems (SWDMNSS 2008)

### Session 1: Wireless Sensor Networks

Scalable Sensor Data Management under Frequent Content Changes in Peer-to-Peer Network .....	133
<i>Masatoshi Sekine and Kaoru Sezaki</i>	
Matrix Routing – An Interference Range Insensitive Routing Protocol for Wireless Sensor Networks .....	137
<i>Monty Beuster, Michael Beigl, Daniel Röhr, Till Riedel, Christian Decker, and Martin Berchtold</i>	
Design and Implementation of Sensor Network on the NGN/IMS .....	141
<i>Yasuhiro Araki, Minh Tuan Nguyen, and Hiroyuki Morikawa</i>	
Managing Heterogeneous Data Flows in Wireless Sensor Networks Using a ‘Split Personality’ Mote Platform .....	145
<i>Danny Hughes, Mickaël Daudé, Geoff Coulson, Gordon Blair, Paul Smith, Keith Beven, and Wlodek Tych</i>	

### Session 2: Data Management and Modeling

Experiences on Data Collection Tools for Wearable and Ubiquitous Computing .....	149
<i>Susanna Pirttikangas, Kaori Fujinami, and Simo Hosio</i>	
Capturing Personal Health Data from Wearable Sensors .....	153
<i>Fabrice Camous, Dónall McCann, and Mark Roantree</i>	
Models and Issues on Probabilistic Data Streams with Bayesian Networks .....	157
<i>Hideyuki Kawashima, Ryo Sato, and Hiroyuki Kitagawa</i>	
Creating Location-Based Services by Utilising a Web of Places .....	161
<i>Benedikt Ostermaier and Philipp Bolliger</i>	

### Session 3: Sensing Techniques and Applications

Detection of Pedestrians Using Subtraction Stereo .....	165
<i>Yuuki Hashimoto, Yusuke Matsuki, Tatsuya Nakanishi, Kazunori Umeda, Kei Suzuki, and Kazunori Takashio</i>	
UME: Method for Estimating User Movement Using an Acceleration Sensor .....	169
<i>Arei Kobayashi, Takeshi Iwamoto, and Satoshi Nishiyama</i>	
Foot-Step Input Method for Operating Information Devices While Jogging .....	173
<i>Tetsuya Yamamoto, Masahiko Tsukamoto, and Tomoki Yoshihisa</i>	

Life2Guard: A Physical Disorder Detection in Private Rooms .....	177
<i>Naoya Namatame, Jin Nakazawa, Kaznori Takashio, and Hideyuki Tokuda</i>	

## **Session 4: Frameworks for Networked Sensing Systems**

ContextXML: A Data Processing Framework for Ubiquitous Computing .....	181
<i>D. Wildschut, T. Riedel, C. Decker, D. Roehr, M. Beigl, and M. Isomura</i>	
Towards a Common Sensor Network API: Practical Experiences .....	185
<i>Filip Šuba, Christian Prehofer, and Jilles van Gorp</i>	
Sharing Worldwide Sensor Network .....	189
<i>Lei Shu, Manfred Hauswirth, Long Cheng, Jian Ma, Vinny Reynolds, and Lin Zhang</i>	

## **The Third International Workshop on Dependable and Sustainable**

### **Peer-to-Peer Systems (DAS-P2P 2008)**

#### **Session 1: Identity, Reputation and Trust**

A Sybil-Resilient Reputation Metric for P2P Applications .....	193
<i>Tien Tuan Anh Dinh and Mark Ryan</i>	
A Recommender Scheme for Peer-to-Peer Systems .....	197
<i>Loubna Mekouar, Youssef Iraqi, and Raouf Boutaba</i>	

#### **Session 2: Reliability and Self-Organization**

A Reliability Model for Result Checking in Volunteer Computing .....	201
<i>Ling Xu, Hong Wang, Hiroyuki Takizawa, and Hiroaki Kobayashi</i>	
Bootstrapping of Peer-to-Peer Networks .....	205
<i>Chris GauthierDickey and Christian Grothoff</i>	
Analysis of a Self-Organizing Maintenance Algorithm under Constant Churn .....	209
<i>Richard Price, Tien Tuan Anh Dinh, and Georgios Theodoropoulos</i>	
A Design for Distributed Backup and Migration of Distributed Hash Tables .....	213
<i>Yusuke Doi, Shirou Wakayama, and Satoshi Ozaki</i>	

#### **Session 3: Fairness and Social Responsibility**

SSS: A Personal File Storage System Considering Fairness among Users Based on Pure P2P Model .....	217
<i>Shouta Morimoto and Fumio Teraoka</i>	
Local Production, Local Consumption Storage Economics for Peer-to-Peer Systems .....	221
<i>Kenji Saito and Eiichi Morino</i>	

# Workshop on Heuristic Methods for the Design, Deployment, and Reliability of Networks and Network Applications (HEUNET 2008)

## Session 1: Networks and Network Applications

A Multilevel Approach for the Routing and Wavelength Assignment Problem .....	225
<i>Thomas Fischer, Kerstin Bauer, and Peter Merz</i>	
Integer Programming Approaches to the Problem of Network Upgrading .....	229
<i>Toshihide Ibaraki, Toshihide Nomura, and Masahiro Sasaki</i>	
Variable Neighborhood Search for a Prize Collecting Capacity Constrained Connected Facility Location Problem .....	233
<i>Markus Leitner and Günther R. Raidl</i>	
Wireless Sensor Network Deployment Using a Memetic Simulated Annealing .....	237
<i>Guillermo Molina and Enrique Alba</i>	
Efficiency Analysis on an Information Sharing Process with Randomly Moving Mobile Sensors .....	241
<i>Akihiro Fujihara and Hiroyoshi Miwa</i>	

## Session 2: Network Design, Deployment and Reliability

Some Communication Aspects in Extended Fibonacci Cubes .....	245
<i>Ioana Zelina, Grigor Moldovan, and Petrică Pop Sitar</i>	
Optimization of the Answering Method with Probability Conversion .....	249
<i>Atsushi Tagami, Chikara Sakaki, Teruyuki Hasegawa, Shigehiro Ano, and Yoichi Tomiura</i>	
Evolutionary Approach to Maxmin-Fair Network-Resource Allocation .....	253
<i>Mario Köppen, Masato Tsuru, and Yuji Oie</i>	
A GRASP Algorithm for the Connected Facility Location Problem .....	257
<i>Alessandro Tomazic and Ivana Ljubić</i>	
Heuristic Cut Separation in a Branch&Cut Approach for the Bounded Diameter Minimum Spanning Tree Problem .....	261
<i>Martin Gruber and Günther R. Raidl</i>	

# Workshop on Middleware Architecture in the Internet (Mid Arch 2008)

## Session 1: Grid Computing Middleware

A Dynamic Window Control Method of Grid Middleware for Volume Data Transfer to Make the Best Use of Reservation Bandwidth .....	265
<i>Naoto Ikeda, Masaaki Noro, Ken-ichi Baba, and Shinji Shimojo</i>	
Consideration of Resource Access History for Optimizing Overlay Networks in P2P-Based Resource Discovery .....	269
<i>Tsutomu Inaba, Yoshitomo Murata, Hiroyuki Takizawa, and Hiroaki Kobayash</i>	

A Communication Relay Mechanism toward Virtual Cluster Computing on the Grid .....	273
<i>Yasuyuki Kusumoto, Susumu Date, Kohei Ichikawa, Shingo Takeda, and Shinji Shimojo</i>	
An Authentication System Development in Application of Grid Middleware to a Nationwide Joint-Use Environment for Computing .....	277
<i>Eisaku Sakane, Manabu Higashida, Shingo Okamura, Toyokazu Akiyama, Ken-ichi Baba, Shinji Shimojo, and Yuuichi Teranishi</i>	

## **Session 2: Network Middleware**

Resource Access Control for Wireless LAN Roaming Systems .....	281
<i>Yoshikazu Watanabe, Hideaki Goto, and Hideaki Sone</i>	
Realizing Policy Roaming by Cooperating Edge-Mobility and Authentication Systems .....	285
<i>Kouji Nishimura, Akio Seki, Hajime Masaoka, Tohru Kondo, Koichi Tashima, Seigo Kishiba, and Reiji Aibara</i>	
Proposal of New Layer of Indirection between Application and Transport Layers for Flexible Communications in IP Networks .....	289
<i>Nobuo Ryoki, Hiroyuki Koga, Kenji Kawahara, and Yuji Oie</i>	

## **Session 3: AAI**

Privacy Oriented Attribute Exchange in Shibboleth Using Magic Protocols .....	293
<i>Toshihiro Takagi, Takaaki Komura, Shuichi Miyazaki, and Yasuo Okabe</i>	
Implementation of PKI Authentication Functions for Network User Authentication System "Opengate" .....	297
<i>Suguru Fujisawa, Makoto Otani, and Kenzi Watanabe</i>	
LESSO: Legacy Enabling SSO .....	301
<i>Takeshi Nishimura and Hiroyuki Sato</i>	

## **Workshop on Social and Personal Computing for Web-Supported Learning Communities (SPeL 2008)**

### **Session 1: Social Computing for Web-Supported Learning Communities**

Learning from Peers: Motivating Students through Reputation Systems .....	305
<i>Marco Temperini and Andrea Sterbini</i>	
Developing a Web 2.0 RESTful Cocoon Web Services for Telemedical Education .....	309
<i>Sabah Mohammed, Ahmed Orabi, Jinan Fiaidhi, and Kalpdrum Passi</i>	
CRICOS: A Web-Based System for Creating Interconnected Communities .....	313
<i>Stefanos Ziovas and Maria Grigoriadou</i>	



## **Session 2: Personal Computing for Web-Supported Learning Communities**

Sustaining Teacher's Professional Development and Training through Web-Based Communities of Practice .....	317
<i>Andreja Istenic Starcic</i>	
Analyzing Learners' Interaction with an Educational Hypermedia System: A Focus on Learning Styles .....	321
<i>Elvira Popescu, Costin Badica, and Philippe Trigano</i>	
An Approach for Personalized Web-Based Vocabulary Learning through Word Association Games .....	325
<i>Jaeyoung Jung and Sabine Graf</i>	
Adaptive and Collaborative Learning Using the LMS/LCMS netUniversity .....	329
<i>Amir Benmimoun and Philippe Trigano</i>	

## **The Fifth Workshop for Ubiquitous Networking and Enablers to Context-Aware Services (UNECAS 2008)**

### **Session 1: Service and Security for Ubiquitous Networking**

Practical Study on Providing Event-Driven Composite Services for Telecom-Enterprise Convergence .....	333
<i>Takaaki Moriya, Yuichi Nakatani, Hiroyuki Ohnishi, Makoto Yoshida, and Miki Hirano</i>	
Evaluation of Social Capital in Context-Aware Content-Provision Service .....	337
<i>Yuki Yokohata, Michiharu Takemoto, Makoto Hamada, and Toshiro Nakamura</i>	
Evaluation of Similarities of Propagation Forms on Social Network for Extracting Relationships of Information .....	341
<i>Susumu Takeuchi, Tomohiro Kondoh, Masanori Akiyoshi, and Norihisa Komoda</i>	
Inter-device Communication Paradigm: Requirements Analysis for Its Security Mechanisms .....	345
<i>Manabu Hirano, Takeshi Okuda, and Suguru Yamaguchi</i>	

### **Session 2: New Technologies for Ubiquitous Networking**

ULP: A Location Platform That Can Handle Multiple Location Representations .....	349
<i>Daiki Terauchi, Keisuke Uehara, Yasuhito Watanabe, Hideki Sunahara, and Fumio Teraoka</i>	
Distributed Sensor Information Management Architecture Based on Semantic Analysis of Sensing Data .....	353
<i>Tomoya Kawakami, Bich Lam Ngoc Ly, Susumu Takeuchi, Yuuichi Teranishi, Kaname Harumoto, and Shojiro Nishio</i>	

Quorum-Based Consistency Management for Data Replication in Mobile Ad Hoc Networks .....	357
<i>Akimitsu Kanzaki, Yohei Sawai, Masako Shinohara, Tahahiro Hara, and Shojiro Nishio</i>	
An Implementation of Lightweight Message Transport Mechanism for P2P Agent Platform on Ad-Hoc Networks .....	361
<i>Kentaro Fujiwara, Yuichi Teranishi, Susumu Takeuchi, Kaname Harumoto, and Shojiro Nishio</i>	

## **Workshop on Power Consumption in Future Network Systems (PCFNS 2008)**

### **Session 1: Energy Reduction Issues on Wireless Network Systems**

Energy Consumption Issues on Mobile Network Systems .....	365
<i>Minoru Etoh, Tomoyuki Ohya, and Yuji Nakayama</i>	
A Prototype of a Multi-core Wireless Sensor Node for Reducing Power Consumption .....	369
<i>Sotaro Ohara, Makoto Suzuki, Shunsuke Saruwatari, and Hiroyuki Morikawa</i>	
Novel Energy Harvesting Technologies for ICT Applications .....	373
<i>Manos M. Tentzeris and Yoshihiro Kawahara</i>	
Applying Low Power Consumption Superconductive Device Technology to Real-Time Waveform Monitoring for Photonic Network .....	377
<i>Mutsuo Hidaka, Michitaka Maruyama, and Hideo Suzuki</i>	

### **Session 2: Energy Reduction Issues on Photonic Network Systems**

Power Saving Strategies and Technologies in Network Equipment Opportunities and Challenges, Risk and Rewards .....	381
<i>Luc Ceuppens, Alan Sardella, and Daniel Kharitonov</i>	
Technologies to Save Power for Carrier Class Routers and Switches .....	385
<i>Masaki Yamada, Takeki Yazaki, Shinji Nishimura, and Naoya Ikeda</i>	
Optical Packet & Path Integration for Energy Savings toward New Generation Network .....	389
<i>Hiroaki Harai</i>	
Dynamic Optical Path Switching for Ultra-Low Energy Consumption and Its Enabling Device Technologies .....	393
<i>S. Namiki, T. Hasama, M. Mori, M. Watanabe, and H. Ishikawa</i>	
The Latest Trend of Low Power High-Speed CMOS I/O Technology for Photonic Network .....	397
<i>Tadashi Ikeuchi, Tszshing Cheung, and Hiroshi Onaka</i>	

# The 2nd International Workshop on Practical Applications of Sensor Networking (PASN 2008)

## Session 1: Design and Implementation for Local Area Sensor Networks

Implementation and Evaluation of a Memory Management System for IPv6 Wireless Sensor Networks .....	401
<i>Hideki Shimada, Takahiko Sato, Kazutoshi Fujikawa, and Hideki Sunahara</i>	
Observing Walking Behavior of Humans Using Distributed Phenomenon Detection and Tracking Mechanisms .....	405
<i>Raja Bose and Abdelsalam (Sumi) Helal</i>	
Obtaining Sensing Data Based on the Proximity of Sensor Nodes .....	409
<i>Kazumasa Kojima, Shigeru Kashihara, Teruaki Yokoyama, Takeshi Okuda, and Suguru Yamaguchi</i>	

## Session 2: Design and Implementation for Global Area Sensor Networks

Composite Event Detection in Heterogeneous Sensor Networks .....	413
<i>Hideki Kamiya, Hiroshi Mineno, Norihiro Ishikawa, Tomoyuki Osano, and Tadanori Mizuno</i>	
An Implementation Methodology of Geographical Location Based Peer-to-peer Networks for Managing Ubiquitous Sensors .....	417
<i>Satoshi Matsuura, Kazutoshi Fujikawa, and Hideki Sunahara</i>	
Accuracy-Based Cache Consistency Management for Numerical Object Replication .....	421
<i>Hideya Ochiai and Hiroshi Esaki</i>	

## The Workshop on ITeS: IT Enabled Services (ITeS 2008)

### Session 1: IT Enabled Services: Business Perspectives

B to C for Revitalizing Rural Economy .....	425
<i>Takashi Okamoto</i>	
Cluster Analysis of E-Commerce Customer Profiles Based on Trust Perception .....	429
<i>Kanokwan Atchariyachanvanich and Noboru Sonehara</i>	
Enterprise Architecture and Information Systems: In Japanese Banking Industry .....	433
<i>Takaaki Kamogawa and Hitoshi Okada</i>	
From Internet Information Searching to Information Summarizing .....	437
<i>Yu-Hui Tao</i>	

## **Session 2: Innovations for ITeS**

Bridging between Real and Virtual – Technologies to Advance ITeS .....	440
<i>Shiro Uesugi</i>	
A Simple Way to Improve the Security of Bluetooth Devices .....	444
<i>Peter Dell and Khwaja Shan-ul-Hasan Ghori</i>	
A Network for Copyright Management and Control of Private Information .....	448
<i>Hirotsugu Kinoshita and Tetsuya Morizumi</i>	
Possibility of Human Grid Computing for Artificial Intelligence Systems .....	452
<i>Yuya Dan</i>	

## **Workshop on Next Generation Service Platforms for Future Mobile Systems (NGSP-FMS 2008)**

### **Session 1: Mobile Communication Technology on Real Field**

Activities for the Improvement of the Services Using the Information and Communication Technologies on the Tokaido-Shinkansen .....	455
<i>Kazuhiro Yamada, Junji Kawazu, Masakatsu Yoshizawa, and Takahiko Hoshino</i>	
Effective Use of Heterogeneous Wireless Links in High Speed Railways by Predictive Scheduling .....	459
<i>Hitoshi Aida and Shinya Kambori</i>	

### **Session 2: Service Platforms for Future Mobile Systems**

A Framework of Community Management with Object Deputy Mechanism for IP Multimedia Subsystem .....	463
<i>Akio Yamamoto, Yasuhiro Araki, and Michael Sweeney</i>	
Ad-Hoc Endpoint Pairing Based on Simultaneous Clicking for Ubiquitous Communications .....	467
<i>Takashi Oshiba, Kazuaki Nakajima, and Hideaki Nebayashi</i>	
<b>Author Index</b> .....	471