

Tenth International Symposium on Autonomous Decentralized Systems

ISADS 2011

Table of Contents

Message from General Chair	xv
Message from Steering Committee Chair	xvi
Message from Technical Program Co-chairs	xvii
ISADS 2011 Committees	xviii
AHSP 2011 Committees	xxi
ADSN 2011 Committees	xxii

Technical Session 1: Wireless Sensor Networks (ISADS 2011)

An Efficient Localized Chain Construction Scheme for Chain Oriented Wireless Sensor Networks	3
<i>Quazi Mamun, Sita Ramakrishnan, and Bala Srinivasan</i>	
Autonomous Background Coordination Technology for Timely Sensor Connection in Wireless Sensor Networks	10
<i>Md. Emdadul Haque, Fan Wei, Yukihiro Fukunaga, Takehiro Gouda, Xiaodong Lu, and Kinji Mori</i>	
SWARM-eTOSSIM: A Simulator for Distributed Energy-Constrained Tiny Devices	17
<i>Mina Jung and Jae C. Oh</i>	
MASPOT: A Mobile Agent System for Sun SPOT	25
<i>Ramon Lopes, Flávio Assis, and Carlos Montez</i>	

Technical Session 2: Sensor & Ad Hoc Networks (ISADS 2011)

Cell Range Extension Techniques for Wide-Area Ubiquitous Network	35
<i>Yosuke Fujino, Shigeru Kuwano, Seiji Ohmori, Takafumi Fujita, and Shuichi Yoshino</i>	
Autonomous Emergency Information Transmission Technology through Community Coordination to Achieve Real-Time in In Wireless Sensor Network System	41
<i>Takehiro Gouda, Fan Wei, Md. Emadatul Haque, Yukihiro Fukunaga, Xiaodong Lu, and Kinji Mori</i>	
Distributed Saddle-Point Computation for Lifetime Maximization in Mobile Sensor Networks	49
<i>Shengwei Yu and C.S. George Lee</i>	
Pro-Reactive Route Recovery with Automatic Route Shortening in Wireless Ad Hoc Networks	57
<i>Zilu Liang, Yuzo Taenaka, Takefumi Ogawa, and Yasushi Wakahara</i>	

Technical Session 3: Railway Systems (ISADS 2011)

Formal Modeling and Verification of RBC Handover of ETCS Using Differential Dynamic Logic	67
<i>Yupeng Liu, Tao Tang, Jintao Liu, Lin Zhao, and Tianhua Xu</i>	
A Proposal of Autonomous Online Expansion Technology for Real-Time System and Its Application to Railway Signalling System	73
<i>Takashi Kunifuji, Hiroshi Ito, Yoshinori Saiki, and Kinji Mori</i>	
Modelling and Verification of the System Requirement Specification of Train Control System Using SDL	81
<i>L. Yuan, T. Tang, and K. Li</i>	
Safety Monitoring for ETCS with 4-valued LTL	86
<i>Xian Li, Ming Chai, Lin Zhao, Tao Tang, and Tianhua Xu</i>	

Technical Session 4: Security (ISADS 2011)

Foundation of Semantic Rule Engine to Protect Web Application Attacks	95
<i>Abdul Razzaq, Ali Hur, Muddassar Masood, Khalid Latif, H. Farooq Ahmad, and Hironao Takahashi</i>	
Modeling Web Applications Design with Automata and Its Verification	103
<i>Kei Homma, Satoru Izumi, Kaoru Takahashi, and Atsushi Togashi</i>	
Application for Autonomous Decentralized Multi Layer Cache System to Web Application Firewall	113
<i>Hironao Takahashi, Hafiz Farooq Ahmad, and Kinji Mori</i>	

Role-Based Access-Control Using Reference Ontology in Clouds	121
<i>Wei-Tek Tsai and Qihong Shao</i>	

Technical Session 5: Vehicular Ad Hoc Network (ISADS 2011)

A Store-Carry-Forward-Based Data Transfer Scheme Using Positions and Moving Direction of Vehicles for VANETs	131
<i>Yasuharu Ohta, Tomoyuki Ohta, Eitaro Kohno, and Yoshiaki Kakuda</i>	
Towards Automated Dependability Analysis of Dynamically Connected Systems	139
<i>Paolo Masci, Marco Martinucci, and Felicita Di Giandomenico</i>	
A Highly Resilient Framework for Autonomous Robotic Swarm Systems Operating in Unknown, Hostile Environments	147
<i>Angie Shia, Farokh B. Bastani, and I-Ling Yen</i>	

Technical Session 6: System (ISADS 2011)

Autonomous Continuous Target Tracking for Multi-sensor Systems and Its Application for Radar Network	157
<i>Tadashi Koga</i>	
Platform for Cooperating Among Field Systems, Control Systems and Enterprise Systems	164
<i>Hidenori Yamamoto and Hiromitsu Kato</i>	
Assurance Technology of System Tests Based on Operators' Aspects	172
<i>Masayuki Matsumoto</i>	
An Ontology-Based Dynamic Service Composition Framework for Intelligent Houses	177
<i>Matei Popovici, Mihnea Muraru, Alexandru Agache, Lorina Negreanu, Cristian Giumale, and Ciprian Dobre</i>	

Technical Session 7: Communication Networks I (ISADS 2011)

Implementation and Verification of Autonomous Decentralized Flow Control Based on Local Interaction	187
<i>Tatsuro Sumi, Chisa Takano, Kenji Ishida, and Masaki Aida</i>	
Mathematically Designing a Local Interaction Algorithm for Autonomous and Distributed Systems	194
<i>Takeshi Kubo, Teruyuki Hasegawa, and Toru Hasegawa</i>	
Effective Parameters in Convergence of Autonomous Distributed Systems Using with Immune System Approach	204
<i>Touraj Banirostam and Mehdi N. Fesharaki</i>	

Autonomous Content-Aware Multi-service Integration Technology to Achieve Timeliness in Evolving Situations	209
<i>Xiaodong Lu and Kinji Mori</i>	

Technical Session 8: Communication Networks II (ISADS 2011)

Distribution of Jobs Based on Communication Time and Cost in Service Oriented Distributed Computing	219
<i>Hamid Mcheick and Farzad Amirjavid</i>	
Nearest Neighbor Task Allocation for Large-Scale Distributed Systems	227
<i>Harumasa Tada</i>	
Autonomous Decentralized Community System for Provision of Service-Assurance to Local Majority Users	233
<i>Khalid Mahmood, Hiro Takahashi, Xiaodong Lu, and Kinji Mori</i>	
Autonomous Community Adjustment Technology for Real-Time Transmission of Emergency Information	240
<i>Fan Wei, Yohei Kotake, Md. Emadatul Haque, Yukihiro Fukunaga, Takehiro Gouda, Xiaodong Lu, and Kinji Mori</i>	

Technical Session 9: Video Calling (ISADS 2011)

Low-Power Off-Chip Memory Design for Video Decoder Using Embedded Bus-Invert Coding	251
<i>Ni Zhou, Fei Qiao, Huazhong Yang, and Hui Wang</i>	
System-Level Evaluation of Video Processing System Using SimpleScalar-Based Multi-core Processor Simulator	256
<i>Zidong Du, Bingbing Xia, Fei Qiao, and Huazhong Yang</i>	
Autonomous Data Reallocation Technology for High Assurance in Streaming Service System	260
<i>Kazuaki Wakao, Tatsuya Tsuda, Xiaodong Lu, and Kinji Mori</i>	

Technical Session 10: Agent-Based Framework (ISADS 2011)

Design of a Robot Cloud Center	269
<i>Zhihui Du, Weiqiang Yang, Yinong Chen, Xin Sun, Xiaoying Wang, and Chen Xu</i>	
Application of Agent in Bus Signal Priority Intersection	276
<i>Xiangfeng Cao, Decun Dong, and Xiaoqing Zeng</i>	
Decentralized Autonomous-Agent-Based Infrastructure for Agile Multiparallel Manufacturing	281
<i>Leo van Moergestel, Erik Puik, Daniël Telgen, and John-Jules Meyer</i>	

Poster Session (ISADS 2011)

Autonomous Community Coordination Technology to Achieve High Assurance in Wireless Sensor Network	291
<i>Fan Wei, Md. Emadatul Haque, Yukihiro Fukunaga, Takehiro Gouda, Xiaodong Lu, and Kinji Mori</i>	
Autonomous Surrounding Community Construction Technology for Assurance in Disaster Support System	295
<i>Titichaya Thanamitsomboon, Riyako Sakamoto, Xiaodong Lu, and Kinji Mori</i>	
A Route Discovery Method for Alleviating Traffic Congestion Based on VANETs in Urban Transportations Considering a Relation between Vehicle Density and Average Velocity	299
<i>Mitsuhsa Kimura, Shinji Inoue, Yoshiaki Kakuda, and Tadashi Dohi</i>	
Fast Detection of Path Failures in an Autonomous Decentralized System	303
<i>Jianli Sun and Yinong Chen</i>	
Autonomous Request Based Community Construction Technology for Wireless Sensor Networks to Achieve High Expandability	307
<i>Md. Emdadul Haque, Fan Wei, Yukihiro Fukunaga, Takehiro Gouda, Xiaodong Lu, and Kinji Mori</i>	
Autonomous Heterogeneous Community Technology for Effective Resource Utilization	311
<i>Titichaya Thanamitsomboon, Hiroyuki Endo, Xiaodong Lu, and Kinji Mori</i>	
Automated Refinement of Dependability Analysis through Monitoring in Dynamically Connected Systems	315
<i>Antonia Bertolino, Antonello Calabrò, Felicita Di Giandomenico, Marco Martinucci, and Paolo Masci</i>	
China Railway Autonomous Service Integration System Based on ADS	319
<i>Jianwu Dang, Shuxu Zhao, and Yangping Wang</i>	
Building a Security Aware Cloud by Extending Internal Control to Cloud	323
<i>Sato Hiroyuki, Kanai Atsushi, and Tanimoto Shigeaki</i>	
An Autonomous Decentralized Service Oriented Architecture for High Reliable Service Provision	327
<i>Luis Carlos Coronado-García, Jesús Alejandro González-Fuentes, Pedro Josué Hernández-Torres, and Carlos Pérez-Leguízamo</i>	
An Autonomous Decentralized System Architecture Using a Software-Based Secure Data Field	331
<i>Luis Carlos Coronado-García, Jesús Alejandro González-Fuentes, Pedro Josué Hernández-Torres, and Carlos Pérez-Leguízamo</i>	

Establishment Phased-In Constructing Method for System Expansion of Tokyo Metropolitan Railway System	335
<i>Daisuke Yagyu, Hideki Osumi, and Hidenari Tokunaga</i>	
A Self-Configurable New Generation Children Tracking System Based on Mobile Ad Hoc Networks Consisting of Android Mobile Terminals	339
<i>Yuichiro Mori, Hideharu Kojima, Eitaro Kohno, Shinji Inoue, Tomoyuki Ohta, Yoshiaki Kakuda, and Atsushi Ito</i>	
Investigation of Energy Consumption of Mobile Station for Instant Messaging Services	343
<i>Yun Won Chung</i>	
Proposing Software Transactional Memory for Embedded Systems	347
<i>Yukikazu Nakamoto, Yusuke Tamura, and Shimpei Yamada</i>	
Technologies Toward High Performance and High Reliability in Suica System	351
<i>Yuichi Hatsuse, Akiko Mano, Hidehiko Nagase, Motoharu Yamana, and Akio Shiibashi</i>	

Special Session on Autonomous Embedded Systems and Networking (ISADS 2011)

Experimental Feasibility Analysis of Primary-Shadow Replication Scheme for I/O Transmission Fault-Tolerance in Auto-Pilot Program of Small Scale UAV	357
<i>Junyeong Kim and Doo-Hyun Kim</i>	
Online Anomaly Symptom Detection and Process's Resource Usage Control	364
<i>Midori Sugaya and Kimio Kuramitsu</i>	
DsVD: An Effective Low-Overhead Dynamic Software Vulnerability Discoverer	372
<i>Zhuo Wang, Zhushou Tang, Kan Zhou, Ruoyu Zhang, Zhengwei Qi, and Haibin Guan</i>	

Special Session on Collaborative Computing (ISADS 2011)

Service Replication Strategies with MapReduce in Clouds	381
<i>Wei-Tek Tsai, Peide Zhong, Jay Elston, Xiaoying Bai, and Yinong Chen</i>	
A Service Registry Meta-model Framework for Interoperability	389
<i>Zaiwen Feng, Rong Peng, Bing Li, Keqing He, Chong Wang, Jian Wang, and Cheng Zeng</i>	
Study on Interaction Behaviors of Micro-autonomous Vehicles	399
<i>Deyi Li, Xiaodong Wang, Wen He, Mu Guo, and Tianlei Zhang</i>	

Special Session on ADS for Mission Critical Systems I (ISADS 2011)

An Autonomous Decentralized Public Key Infrastructure	409
<i>Luis Carlos Coronado-García and Carlos Pérez-Leguízamo</i>	
Research on the Method of Interoperability Test for the Onboard Equipment of CTCS-3 Train Control System of Chinese Railway	415
<i>Yu Liu and Tao Tang</i>	
Design and Implementation of HL7 V3 Standard-Based Service Aware System	420
<i>Mehtab Alam, Maqbool Hussain, Muhammad Afzal, Maajid Maqbool, H. Farooq Ahmad, and Somia Razzaq</i>	

Special Session on ADS for Mission Critical Systems II (ISADS 2011)

An Architecture of MicroGrid Based on Role on Autonomous Decentralized System	429
<i>Peng Li, Tianhu Ma, and Yongdong Tan</i>	
Research on the Fault Tolerance Mechanism for On-Board Fault Early Warning System Based on ADS Theory	435
<i>Xiao-Qing Zeng, Lei Qiu, Fan Mo, Shao-Yin Wang, and Zhi Chen</i>	

Special Session on Network Software (ISADS 2011)

Towards a Multiagent-Based Software Architecture for Sensor Networks	441
<i>Juergen Dunkel</i>	
Socio-familiar Personalized Service and Its Application—Towards a New Network Software for Next Generation Ubiquitous Service	449
<i>Kazuo Hashimoto, Gen Kitagata, Hideyuki Takahashi, Atushi Takeda, Debasish Chakraborty, and Norio Shiratori</i>	
Introduction of Ubiquitous Service Platform Project CUBIQ	456
<i>Masayoshi Ohashi</i>	
Self-Stabilization in Energy-Constraint Wireless Ad Hoc Networks	462
<i>Szu-Chi Wang and Hiroyuki Morikawa</i>	

Session I: Ad Hoc Networks, Wireless Mesh Networks, Wireless LAN (AHSP 2011)

An ARQ Scheme Using NACK for Network Coding in Wireless Multihop Networks	471
<i>Hiraku Okada, Hiroya Hiramuki, and Kenichi Mase</i>	
A Data Transfer Scheme Using Autonomous Clustering in VANETs Environment	477
<i>Satoshi Teshima, Tomoyuki Ohta, Eitaro Kohno, and Yoshiaki Kakuda</i>	
Analysis of Ad Hoc Network Performance for Disaster Communication Models	483
<i>Keigo Shimoda and Koichi Gyoda</i>	
Distance-and-Rate Dependent RTS/CTS Reservation in Wireless LAN for Enhancing Spatial Reuse	489
<i>Hiroaki Morino, Masugi Inoue, and Tohru Sanefuji</i>	

Session II: P2P, Load Balancing (AHSP 2011)

A Resource-Efficient Method for Crawling Swarm Information in Multiple BitTorrent Networks	497
<i>Masahiro Yoshida and Akihiro Nakao</i>	
A Load Reduction System to Mitigate Flash Crowds on Web Server	503
<i>Kenji Yokota, Takuya Asaka, and Tatsuro Takahashi</i>	
Distributed Incremental Construction Method of Delaunay Overlay Network Using Detour Paths	509
<i>Masaaki Ohnishi and Masugi Inoue</i>	

Invited Talk (AHSP 2011)

Special Session (AHSP 2011)

Applying the Tree Algorithm with Prioritization for Body Area Networks	519
<i>R. Annur, N. Wattanamongkhol, S. Nakpeerayuth, L. Wuttisittikulkij, and Jun-ichi Takada</i>	
Service Brokering and Mediation: Enabling Next Generation Market and Customer Driven Service Delivery	525
<i>Kong E. Cheng, Yitzchak M. Gottlieb, Gary M. Levin, and Fuchun Joe Lin</i>	

Session III: Implementation of Wireless Ad Hoc Networks (AHSP 2011)

Safety Support System on School Routes Based on Grouping of Children in Mobile Ad Hoc Networks	533
<i>Atsushi Ito, Yoshiaki Kakuda, Tomoyuki Ohta, and Shinji Inoue</i>	
Regional Wireless Network Platform for Context-Aware Services and Its Implementation	539
<i>Yasunori Owada, Masugi Inoue, and Masaaki Ohnishi</i>	

Session IV: Wireless Sensor Networks, Mobile Sensing (AHSP 2011)

A New SMN Configuration Method for RSR Considering Node Energy Consumption in MANETs	547
<i>Mario Takeuchi, Eitaro Kohno, Tomoyuki Ohta, and Yoshiaki Kakuda</i>	
A Performance Study of GPSR and GRMax with Grid and Randomly Distributed Nodes in Wireless Sensor Networks	553
<i>Attoungble Kouakou Jean Marc and Kazunori Okada</i>	
Error-Tolerance in Quantifying Traffic States Using Mobile Phones	559
<i>Quang Tran Minh and Eiji Kamioka</i>	

Session V: Distributed Computing (AHSP 2011)

A Study on Performance of Processes in Migrating Virtual Machines	567
<i>Yosuke Kuno, Kenichi Nii, and Saneyasu Yamaguchi</i>	
A Server Cache Size Aware Cache Replacement Algorithm for Block Level Network Storage	573
<i>Yusuke Nagasako and Saneyasu Yamaguchi</i>	

Keynote Speech (ADSN 2011)

Prospects on R&D for New-Generation Networks	579
<i>Masayuki Murata</i>	

Panel Discussion on Assurance Networks (ADSN 2011)

The Permanent Challenge: How to Enhance Assurance to Users of Computer and Communication Systems?	583
<i>Mirosław Malek</i>	
Assuring Mobile Physical Services for the New Generation of Networks	585
<i>Yinong Chen</i>	

Special Session on New-Generation Networks (ADSN 2011)

Assurance Diversity Network Platform for NWGN - From New-Generation Network Vision to Multiple Customized Networks	591
<i>Toshiaki Suzuki, Nozomu Nishinaga, and Akihiro Nakao</i>	
Autonomous and Adaptive Wireless Networking with Bio-inspired Algorithms	597
<i>Naoki Wakamiya and Masayuki Murata</i>	

Regular Session 1 (ADSN 2011)

Experimental Evaluation of TCP-STAR for Satellite Internet over WINDS	605
<i>Hiroyasu Obata, Kazuya Tamehiro, and Kenji Ishida</i>	
A Transition Reduction Method for FSM of MANET Routing Protocol with Blacklist	611
<i>Hideharu Kojima, Tomoyuki Ohta, and Yoshiaki Kakuda</i>	
SMSS: Symmetric-Masquerade Security Scheme for VANETs	617
<i>Lingyun Zhu, Chen Chen, Xin Wang, and Azman Osman Lim</i>	

Regular Session 2 (ADSN 2011)

Minimizing Restart Time for Fast Rejuvenation and Availability Enhancement	625
<i>Sudhanshu Shekhar Jha, Adrian Jonel Krdu, and Miroslaw Malek</i>	
An Approach for Service Composition and Testing for Cloud Computing	631
<i>Wei-Tek Tsai, Peide Zhong, Janaka Balasooriya, Yinong Chen, Xiaoying Bai, and Jay Elston</i>	
A Unified Design Model for Assurance Networks and Its Application to Mobile Ad Hoc Networks	637
<i>Yoshiaki Kakuda and Miroslaw Malek</i>	

Special Session on Multidisciplinary Emerging Networks and Systems (ADSN 2011)

Application of Reinforcement Learning to Software Rejuvenation	647
<i>Hiroyuki Okamura and Tadashi Dohi</i>	
Flowable Services: A Human-Centric Framework toward Service Assurance	653
<i>Qun Jin, Yishui Zhu, Roman Y. Shtykh, Neil Y. Yen, and Timothy K. Shih</i>	
Overview of Modeling and Analysis of Incentive Mechanisms Based on Evolutionary Game Theory in Autonomous Networks	659
<i>Yufeng Wang, Akihiro Nakao, Athanasios V. Vasilakos, and Jianhua Ma</i>	
Author Index	665