2012 13th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing

SNPD 2012

Table of Contents

Message from the Conference Chair ................................................................. xvii
Message from the Program Co-Chairs ............................................................. xviii
Organizing Committee ..................................................................................... xix
Program Committee ......................................................................................... xx
Keynote Abstracts .............................................................................................. xxiii

Algorithms

Query Range Sensitive Probability Guided Multi-probe Locality Sensitive Hashing .............................................................. 3

Xiaoguang Gu, Lei Zhang, Dongming Zhang, Yongdong Zhang, Jintao Li,
and Ning Bao

Artificial Intelligence

A Computational Model of Imitation and Autonomous Behavior .................. 13

Tatsuya Sakoto, Motoryuki Ozeki, and Natsuki Oka

Does Talking to a Robot in a High-Pitched Voice Create a Good Impression of the Robot? ................................................................. 19

Shibata Ryoko, Fukada Chie, Kojima Takatsugu, Sato Kaori, Hashikura Yuki,
Ozeki Motomyuki, and Oka Natsuki

The Efficiency of Interactive Differential Evolution in Creation of Sound Contents: In Comparison with Interactive Genetic Algorithm .............................................................. 25

Makoto Fukumoto, Ryota Yamamoto, and Shintaro Ogawa
Audio and Video Technology
Multimodal Medical Image Fusion in Modified Sharp Frequency Localized Contourlet Domain .................................................................33
  Seiichi Serikawa, Huimin Lu, Yujie Li, and Lifeng Zhang

Collaborative Computing
Comparative Analysis of Access Control Systems on Cloud ..........................................................41
  Um-e-Ghazia, Rahat Masood, and Muhammad Awais Shibli

Communication Systems and Networks
Admission Control Strategy of Serving Peers in P2P VoD Systems ..............................................49
  Yanqin Zhu, Jianjun Bian, Qijin Ji, and Haojun Zhang
Pricing Model and Real Options in 4G LTE Mobile Network ......................................................54
  Wichian Premchaiswadi and Santi Pattanavichai

Component-Based Software Engineering
Understanding Botnet: From Mathematical Modelling to Integrated Detection and Mitigation Framework .................................................................63
  Wang Yong, Solomon Haile Tefera, and Yonas Kibret Beshah

Data Mining and Machine Learning
A Novel Online Event Analysis Framework for Micro-blog Based on Incremental Topic Modeling .................................................................73
  Huifang Ma, Bo Wang, and Ning Li
Does it Matter What They Said? A Text Mining Analysis of the State of the Union Addresses of USA Presidents .................................................................77
  Steven Crockett and Carl Lee
DSCLU: A New Data Stream Clustering Algorithm for Multi Density Environments .................................................................83
  Amin Namadchian and Gholamreza Esfandani
Enhance the Multi-level Fuzzy Association Rules Based on Cumulative Probability Distribution Approach .................................................................89
  Jr-Shian Chen, Fuh-Gwo Chen, and Jen-Ya Wang
Factor Analysis for Influence Maximization Problem in Social Networks .................................................................95
  Xing Shang, Xiang Chen, Zhiwei Jiang, Qing Gu, and Daoxu Chen
GDCLU: A New Grid-Density Based Clustering Algorithm .................................................................102
  Gholamreza Esfandani, Mohsen Sayyadi, and Amin Namadchian
Heuristic Attempts to Improve the Generalization Capacities in Learning SVMs ........................................108  
*Luminita State, Catalina Cocijanu, and Marinela Mircea*

**Database System Management**  
Semantic Generalization in a Graph-Based Data Model .................................................................117  
*Yuki Ohira, Teruhisa Hochin, and Hiroki Nomiya*

**Embedded Systems**  
Shared-Cache Simulation for Multi-core System with LRU2-MRU Collaborative  
Cache Replacement Algorithm ...........................................................................................................127  
*Shan Ding, Shiya Lui, and Yuanyuan Li*

**Image, Speech, and Signal Processing**  
An Improved Image Segmentation Algorithm Based on the Otsu Method .....................................135  
*Mengxing Huang, Wenjiao Yu, and Donghai Zhu*

Person Identification Using Top-View Image with Depth Information ...........................................140  
*Daichi Kouno, Kazutaka Shimada, and Tsutomu Endo*

**Internet Technology and Applications**  
Constructing DN Model-Based Information Sources ........................................................................149  
*Yoshihide Hosokawa and Kazunori Tamegai*

Status and Trend of E-book Applications for iOS Devices: A Developer’s Perspective .........................157  
*Tse-Ming Tsai, Shih-Chun Chou, Bo-Fu Liu, Yuting Lin, Rong-Sheng Wang, Ren-Dar Yang, and Seng-Cho T. Chou*

Value Modeling and Calculation for Everything as a Service (XaaS) Based on Reuse .........................162  
*Yucong Duan*

**Mobile/Wireless/Ad-Hoc Networks**  
Theoretical Modelling IEEE 802.15.4 MAC Protocol with Retransmission for Wireless Personal Area Networks in Medical and Healthcare Deployment .................................................171  
*Zhongwei Zhang and Hong Zhou*

Realize Multi-hop Node Localization in Wireless Networks ..............................................................177  
*Wang Anbao and Zhang Shiming*

Time Synchronization for Failure Tolerance in Wireless Sensor Network .............................................181  
*Na Wang and Haihui He*
Natural Language Processing

A Possibilistic Approach for the Automatic Morphological Disambiguation of Arabic Texts ................................................................. 187

Raja Ayed, Ibrahim Bounhas, Bilel Elayeb, Fabrice Evrard, and Narjès Bellamine Ben Saoud

Genetic Algorithm for Arabic Word Sense Disambiguation ....................................................................................................................... 195

Mohamed El Bachir Menai and Wojdan Alsaeedan

Neural Networks and Genetic Algorithms

Feedback GMDH-type Neural Network Self-Selecting Various Functions and Its Application to Medical Image Diagnosis of Lung Cancer ........................................................................................................... 203

Tadashi Kondo, Junji Ueno, and Shoichiro Takao

Operating Systems

Architecting RTOS for Extensibility by Heterogeneous Multiprocessing with Proxy Kernels .......................................................................................................................... 211

Shuichi Oikawa

Parallel and Distributed Computing

A Middleware-based Implementation for Data Integration of Remote Devices .................................................................................................................. 219

Xianyong Liu, Lizhuang Ma, and Yanping Liu

Implement Improved Loop Level OpenMP Program Based on Parallel Region Reconstruction .......................................................................................................................... 225

Shi'an Hu, Aixian Dong, and Hongtu Ma

Optimizing Sparse Matrix Vector Multiplication Using Cache Blocking Method on Fermi GPU ............................................................................................................... 231

Weizhi Xu, Hao Zhang, Shuai Jiao, Da Wang, Fenglong Song, and Zhiyong Liu

Parallel Implementation of Apriori Algorithm Based on MapReduce ...................................................................................................................... 236

Ning Li, Li Zeng, Qing He, and Zhongzhi Shi

Parallel Text Matching Using GPGPU ................................................................................................................................. 242

Ryosuke Takahashi and Ushio Inoue

Preemption of a CUDA Kernel Function ................................................................................................................................. 247

Jon Calhoun and Hai Jiang

Simulated Performance Evaluation of a 6D Mesh/IBT Interconnect .................................................................................................................. 253

Rui Feng, Peng Zhang, and Yuefan Deng

Smart Energy Management of Multi-threaded Java Applications on Multi-core Processors ................................................................................................................................. 260

Fuh-Gwo Chen, Kuo-Yi Chen, Jr-Shian Chen, and Chi-Chen Shui
Software Specification and Architecture
A Model-Based Approach to Constructing Safe Soft Real-Time Programs
for Non-Real-Time Environments .................................................................269
Ilankaikone Senthooran and Takuo Watanabe
Towards a Formal Integrated Model for Function and User Interface ......................275
Zhu Bin, Zhang Shiming, and Wang Anbao

Software Testing
An Approach to Modeling and Verifying Router-Based Network ........................................283
Dandan Sun, Huai Kou Miao, Shengbo Chen, and Honghao Gao
Bad Smells and Refactoring Methods for GUI Test Scripts .............................................289
Woei-Kae Chen and Jung-Chi Wang
Developing a Bayesian Network Model Based on a State and Transition Model
for Software Defect Detection ........................................................................295
Nipat Jongsawat and Wichian Premchaiswadi
Test Case Generation Technique Based on Extended Coverability Trees ..................301
Tomohiko Takagi and Zengo Furukawa
Test Suite Reduction Using Weighted Set Covering Techniques ..............................307
Shengwei Xu, Huai Kou Miao, and Honghao Gao

SS01 Human Symbiotic Systems
A Study for Vision Based Data Glove Considering Hidden Fingertip
with Self-Occlusion .....................................................................................315
Sanshiro Yamamoto, Kenji Funahashi, and Yuji Iwahori
A Study on Extraction Method of Synonyms in Specification Documents ..................321
Yasushi Kawai, Tomohiro Yoshikawa, Takeshi Furuhashi, Eiji Hirao,
Ayako Kuno, and Tomohisa Gotoh
Estimating Subjective Assessments Using a Simple Biosignal Sensor .....................325
Yoshihito Maki, Genma Sano, Yusuke Kobashi, Tsuyoshi Nakamura,
Masayoshi Kanoh, and Koji Yamada
Forecasting Students’ Grades Using a Bayesian Network Model and
an Evaluation of Its Usefulness ....................................................................331
Keisuke Itoh, Hirotaka Itoh, and Kenji Funahashi
Interactive Sound Generation System Based on Instruction Recognition
of Human Body Motion .............................................................................337
Hotaka Kitabora, Yoichiro Maeda, and Yasutake Takahashi
SS02 Technology Acceptance and Online Behavior

A Study on the Using Behavior of Depot-Logistic Information System in Taiwan: An Integration of Satisfaction Theory and Technology Acceptance Theory .................................................................................................................................................................347

Dauw-Song Zhu, Chung-Hung Tsai, Yu-Li Lan, and Ding-Long Li

Applying the Technology Acceptance Model to Explore Intention to Use Telecare System in Taiwan .................................................................................................................................................................................................................................353

Su-Pi Su, Chung-Hung Tsai, and Yi-Kang Chen

Causes and Effects of E-service Quality for Online Banking ..................................................................................................................................................................................................................357

Dauw-Song Zhu and Thomson Chih-Te Lin

Cohesiveness and Sense of Community of Fan Club Members at Facebook Pages .............................................................................................................................................................................................................................................362

Dauw-Song Zhu, Min-Jon Kuo, and Ting-Rong Lee

TAM’s Application: E-service Quality Study in Online Apparel Store ..............................................................................................................................................................................................................................................368

Zui Chih (Rick) Lee and Paul Dion

SS03 The Art of Humanities Computing

A Corpus Study of Emotive Adjectives and Verbs of the Heian Japanese .................................................................................................................................................................................................................................377

Makiro Tanaka and Hilofumi Yamamoto

Diachronic Corpus and Linguistic Space: New Methods for the Analysis of Language Change ..................................................................................................................................................................................................................................................................................381

Hilofumi Yamamoto, Makiro Tanaka, and Yasuhiro Kondo

Impression Evaluation Method Considering the Vagueness of Kansei .................................................................................................................................................................................................................................385

Shunsuke Akai, Teruhisa Hochin, and Hiroki Nomiya

Introducing Scientific Methods for the Interpretation of the Bible: Quantitative Analysis of Christian Documents ..............................................................................................................................................................................................................................................391

Hajime Murai

Kansei Information and Movement Characteristics Related to the Expression of Joy in Dance: An Investigation for Analyzing Rousing and Stimulating Dance Motions ..................................................................................................................................................................................................................................................................................399

Nao Shikanai, Kozaburo Hachimura, Misako Sawada, and Motonobu Ishii

Relationships between Periodic Behaviors in Micro-blogging and the Users’ Baseline Mood ..............................................................................................................................................................................................................................................405

Masashi Komori, Naohiro Matsumura, Asako Miura, and Chika Nagaoka
SS04 Multi-agent Technology, Platforms, and Systems

An Approximate Algorithm for DCOP with Optimal Solution Attainment Rate of 0.99
Yasuki Iizuka

Common Hybrid Agent Platform—Sustaining the Collective
Radu Serban, Hongliang Guo, and Alfons Salden

MAST: From a Toy to Real-Life Manufacturing Control
Pavel Vrba, Vladimir Mařík, and Petr Kadera

Modelling Large Complex Systems Using Multi-agent Technology
George Rzevski

Multi-agent Stochastic Systems with Switched Topology and Noise
Konstantin Amelin, Natalia Amelina, Oleg Granichin, and Olga Granichina

Physicomimetics for Mobile Robot Obstacle Avoidance
Suranga Hettiarachchi and William M. Spears

Real-Time Multi-agent Forecasting and Replenishment Solution for LEGOs
Branded Retail Outlets
Bjorn Madsen, Petr Skobelev, George Rzevski, and Alexander Tsarev

Self-Evolving Decision Support Systems in Multi-agent Environment
Hasanov Tofig, Motoyuki Ozeki, and Natsuki Oka

SS05 Experiences of Software Engineering

A Study of Student Experience Metrics for Software Development PBL
Umekawa Kohichi, Hiroshi Igaki, Yoshiki Higo, and Shinji Kusumoto

Aggregation of Development History from Distributed Support Systems
Hiroki Kawai, Hidetake Uwano, and Soichiro Tani

An Ensemble Approach of Simple Regression Models to Cross-Project Fault Prediction
Satoshi Uchigaki, Shinji Uchida, Koji Toda, and Akito Monden

Experimental Report of the Exercise Environment for Software Development PBL
Naoki Fukuyasu, Sachio Saiki, Hiroshi Igaki, and Yuki Manabe

Joined View Editor for Mashups of Web Data Stores
Yoshio Kumagai, Masaya Senba, Takakazu Nagamine, and Tomio Kamada

Lessons Learned from Collaborative Research in Software Engineering: A Student’s Perspective
Anakorn Jongyindee, Pattara Leelaprute, Masao Ohira, and Ken-ichi Matsumoto
Program Incomprehensibility Evaluation for Obfuscation Methods
with Queue-based Mental Simulation Model ..............................................................498

_Haruaki Tamada, Kazumasa Fukuda, and Tomoya Yoshioka_

Task Classification with Chronological Action History for PSP Support ................................................504

_Ryouta Ohashi, Hidetake Uwano, and Takao Nakagawa_

**SS06 Intelligent Software: Theory and Application**

A Comparison of Ridge Detection Methods for DEM Data ..........................................................513

_Shinji Koka, Koichi Anada, Yasunori Nakayama, Kimio Sugita, Takeo Yaku,
and Ryusuke Yokoyama_

Development of a Software Security Learning Environment ..........................................................518

_Attsuo Hazeyama and Hiroto Shimizu_

Efficiency of Concurrent Processing of Sort Using CSP ..............................................................524

_Yasunori Shiono, Shohi Noguchi, Mitsumasa Mochida, Tomoo Sumida,
Hideki Mori, Kazuhito Ohmaki, and Kensei Tsuchida_

O(n) and O(n2) Time Algorithms for Drawing Problems of Tree-Structured
Diagrams ................................................................................................................................................530

_Tadaaki Kirishima, Tomoo Sumida, Yasunori Shiono, Goto Takaaki,
Takeo Yaku, Tetsuro Nishino, and Kensei Tsuchida_

Survey on Body of Knowledge Regarding Software Security .........................................................536

_Attsuo Hazeyama_

UNL Ontology Visualization for Web ..............................................................................................542

_Khan Md. Anwarus Salam, Hiroshi Uchida, Setsuo Yamada, and Tetsuro Nishino_

**SS07 Multimedia and Kansei Engineering**

Digital Archive for Japanese Intangible Cultural Heritage Based
on Reproduction of High-Fidelity Sound Field in Yamahoko Parade of Gion
Festival .............................................................................................................................................549

_Takahiro Fukumori, Takanobu Nishiura, and Yoichi Yamashita_

Estimation of Kandoh Degree with Emphasis on Spatial Sound Impressions ................................555

_Satoshi Oode and Akio Ando_

Evaluation of Realism of Dynamic Sound Space Using a Virtual Auditory
Display ...............................................................................................................................................561

_Yukio Iwaya, Masahi Toyoda, Makoto Otani, and Yôiti Suzuki_

Kansei Estimation Models for the Sense of Presence in Audio-Visual Content
with Different Audio Reproduction Methods ......................................................................................567

_Kenji Ozawa, Masashi Obinata, and Yuichiro Kinoshita_
On the Tendency of Arousing Mental States with Strong Emotion
by Presenting Audiovisual Materials

Yusuke Nakata, Teruhisa Hochin, and Hiroki Nomiya

Physical Factors and Spatial Impressions of Surround Sound Recording

Toru Kamekawa and Atsushi Marui

SS09 Software Estimation

Software Effort Estimation in the Early Stages of the Software Life Cycle Using
a Cascade Correlation Neural Network Model

Ali Bou Nassif, Luiz Fernando Capretz, and Danny Ho

SS10 Innovative Switch Architectures for Future Networks

An Optimization for Channel Estimation Based on Compressed Channel Sensing

Si Zhang, Jian Kang, Yichuan Song, and Nannan Wang

Dynamic Virtual Switch Protocol Using Openflow

Miao Tang, Qiaochu Lv, Zheng Lu, Qi Zhao, and Yichuan Song

Improved Minimum Hop Routing Protocol in WSN

Yankun Li, Ming Zhu, Haiqin Qu, Nannan Wang, and Yichuan Song

Research on the Interconnection Model between Vehicular CAN Network and Internet Based on In-vehicle Gateway

Bo Hao, Yanheng Liu, Da Wei, Yao Sun, and Zhiyi Fang


Yi Zhang, Zhiyi Fang, Hongyu Sun, and Lin Chen

Token Based Scheduling Algorithm for Advanced IMOTS(N) Switch Architecture

Jianfei Zhang, Zhiyi Fang, Hyung Jae Chang, and S.Q. Zheng

SS13 Future Internet Architectures and Experimental Facilities

Applications of the Future Internet Engineering Project

Adam Grzech, Krzysztof Juszczyszyn, Paweł Swiatek, Cezary Mazurek, and Arkadiusz Sochan

Content Aware Network Based on Virtual Infrastructure


Content Espresso: A Global Secure Large File Sharing System for Media Industries

Kunitake Kaneko, Daisuke Ando, and Fumio Teraoka
Energy Efficient and Enhanced-Type Data-Centric Network (E3-DCN) .................................................................655
  Satoru Okamoto, Naoaki Yamanaka, Daisuke Matsubara, and Hitoshi Yabusaki

Experiments on Multi-layer Network Virtualization towards the Software Defined Transport Network .......................................................................................................................661
  Akeo Masuda, Akinori Isogai, Daisaku Shimazaki, Yoshihiko Uematsu, and Atsushi Hiramatsu

PL-LAB: Polish Future Internet Distributed Laboratory .............................................................................................................666
  Radosław Krzywania, Łukasz Dolata, Piotr Krawiec, Waldemar Latoszek, Andrzej Szymański, and Jacek WszoŁek

Virtualization Devices for Prototyping of Future Internet ...........................................................................................................672
  Andrzej Chydzinski, Mariusz Rawski, Piotr Wisniewski, Blazej Adamiczyk, Iwo Olszewski, Piotr Szotkowski, Lukasz Chrost, Pawel Tomaszewicz, and Damian Parniewicz

Virtualized Network Infrastructure Supporting Co-existence of Parallel Internets ....................................................................................................................................................679
  Wojciech Burakowski, Halina Tarasiuk, Andrzej Beben, and Grzegorz Danilewicz

SS15 Applications of Parallel and Distributed Processing

A Mechanism to Protect Tokens from Dishonest Uses ..................................................................................................................687
  Yusuke Ohashi, Shinsuke Tamura, and Shuji Taniguchi

Adaptive Parameter Adjustment of a Real-Time SPH Simulation for Interactive Virtual Environments: Application to Parallel Processing ...........................................................................................................692
  Masayuki Kawai and Yohei Suzuki

An Efficient Join Query Processing Based on MJR Framework ........................................................................................................698
  Shih-Ying Chen and Po-Chun Chen

A User-Friendly Computation System on the Web with Octuple-precision Implementation and Evaluation of a Mail Gateway System Reducing Bounce Mail Caused by Erroneous Forward Settings ...........................................................................................................................................................................710
  Yoshihiko Ishibashi, Takumi Kouga, and Hideo Masuda

Incremental Data Migration for Multi-database Systems ........................................................................................................716
  Ken Higuchi, Wenqian Wang, and Tatsuo Tsuji

Prototype Implementation of a GPU-based Interactive Coupled Fluid-Structure Simulation ........................................................................................................721
  Ryota Henmi, Yusuke Nishimura, Hiroaki Suzuki, Shinji Fukuma, Shin-ichiro Mori, Akinori Yamaguchi, and Shinji Tomita

Towards Parallel Processing of Similarity Retrieval System of Time Series ......................................................................................726
  Ryohel Azuma, Teruhsai Hochin, Hiroki Nomiya, Hideya Nakanishi, and Mamoru Kojima

xiv
SS16 Data Mining for Info-communication Service and Its Diffusion
A Consideration of Micro Area Selection Technique for the Diffusion of ICT Infrastructure ................................................................. 735
Motoi Iwashita

Identifying Purchase-Stage by Applying Pattern Mining to Web Access Logs ................................................................. 740
Manabu Motegi, Yusuke Ichikawa, and Toru Kobayashi

Immune Network Based Text Clustering Algorithm ........................................................................................................... 746
Ma Li, Yang Lin, Bai Lin, and Wang Rongxi

KC3 Browser: Semantic Service Mush-up for Global Knowledge Sharing and Discovery ........................................................................ 754
Michiaki Iwazume, Ken Kaneiwa, and Ichiro Kobayashi

Mobile-Carrier Churning Behavior Modeling Based on Customer Satisfaction ........................................................................ 760
Satoshi Nakano, Akiya Inoue, Kiyotaka Otsuka, Takeshi Kurosawa, Motoi Iwashita, and Ken Nishimatsu

Mobile Internet-Access Behavior Analysis ........................................................................................................................................ 766
Akiya Inoue, Ryouhei Nagahata, Yuuta Ishii, Masaya Dobashi, Rei Kaku, and Motoi Iwashita

Risk Management to User Perception of Insecurity in Ambient Service .................................................................................. 771
Shigeaki Tanimoto, Daisuke Sakurai, Yosiaki Seki, Motoi Iwashita, Hiroyuki Sato, and Atsushi Kanai

SS17 Practical and Theoretical Optimization for Real Systems in Information Science
Explaining Estimation of Factor Scores of Question and Answer Statements ................................................................. 779
Yuya Yokoyama, Teruhisa Hochin, Hiroki Nomiya, and Tetsuji Satoh

Grouping Beginner’s Programming Ability for Animation Creation Using Cluster Analysis ................................................................. 785
Chieko Matsuyama, Toyoshiro Nakashima, and Naohiro Ishii

Taking Lifelog Videos and Managing Impressive Scenes ........................................................................................................... 791
Atsushi Morikuni, Hiroki Nomiya, and Teruhisa Hochin

Visual and Multimedia Computing
Maximum Local Energy Based Multifocus Image Fusion in Mirror Extended Curvelet Transform Domain ................................................................. 799
Lifeng Zhang, Huimin Lu, Yujie Li, and Seiichi Serikawa
Web-Based Applications

A Survey on Service Contract ..........................................................805
  Yucong Duan

Modeling Service Value Transfer Beyond Normalization ........................................811
  Yucong Duan

The Web-Based Assessment for Inundated Area Detection ....................................817
  Ponthip Limlahapun and Hiromichi Fukui

Author Index ..................................................................................823