2017 Fifth International Symposium on Computing and Networking (CANDAR 2017)

Aomori, Japan
19 – 22 November 2017

IEEE Catalog Number: CFP1719X-POD
ISBN: 978-1-5386-2088-5

Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1719X-POD
ISBN (Print-On-Demand):	978-1-5386-2088-5
ISBN (Online):	978-1-5386-2087-8
ISSN:	2379-1888

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings .com

2017 Fifth International Symposium on Computing and Networking

CANDAR 2017

Table of Contents

Message from General and Program Chairs xvi

Symposium Organization xvii

Workshops Organization xviii

Track Program Committees xxvi

Reviewers xxx

Fifth International Symposium on Computing and Networking (CANDAR 2017)

CANDAR 2017 Long Papers

Slice Swarms for HPC Application Resilience 1
Anis Alazzawe and Krishna Kant

Single Kernel Soft Synchronization Technique for Task Arrays on CUDA-enabled GPUs, with Applications 11
Shunji Funasaka, Koji Nakano, and Yasuaki Ito

Performance Improvement of a Two-Dimensional Flood Simulation Application in Hybrid Computing Environments 21
Ryan Marshall, Sheikh K. Ghafoor, Alfred J. Kalyanapu, Mike Rogers, and Tigstu T. Dullo

Tight Lower Bounds on the Maximum Number of Hops in P2P Video Streaming through Multiple Spanning Trees 30
Takuya Shoji and Satoshi Fujita

A Square Pointillism Image Generation, and Its GPU Acceleration 38
Hiroki Tokura, Yuki Kuroda, Yasuaki Ito, and Koji Nakano

A Hybrid Architecture for the Approximate String Matching on an FPGA 48
Takuma Wada, Shunji Funasaka, Koji Nakano, and Yasuaki Ito

Large-Scale Interconnection Network Simulation Methods Based on Cellular Automata 58
Takashi Yokota, Kanemitsu Ootsu, and Takeshi Ohkawa

Fifth International Symposium on Computing and Networking (CANDAR 2017)

CANDAR 2017 Regular Papers

Semi-order Preserving Encryption Technique for Numeric Data to Enhance Privacy 68
Saleh Ahmed, Annisa, Asif Zaman, Zhan Zhang, Kazi Md. Rokibul Alam, and Yasuhiko Morimoto

Energy-Efficient BLE Device Discovery for Internet of Things 75
Bo-Ren Chen, Shin-Ming Cheng, and Jia-Jhun Lin

Complex Dynamics, Evolution, Separation, Profile Modeling of Fire in 3D for Computer Animation 80
Roman Ďurikovič and Jozef Hladký

A Galindo-Garcia-Like Identity-Based Signature with Tight Security Reduction 87
Masayuki Fukumitsu and Shingo Hasegawa

Analysis of Multiple Darknet Focusing on Outbound Packets and its Application to Malware Analysis 94
Keisuke Furumoto, Korehito Kashiki, Masakatu Morii, Masato Ikegami, Tomohisa Hasegawa, Teiichi Ishikawa, and Koji Nakao

Improved Differential Evolution with Searching Pioneer for Solving Multi-modal Optimization Problems 101
Chun-Ling Lin, Sheng-Ta Hsieh, and Shih-Yuan Chiu

HDR Image Acquisition Using Integrated Mobile Device Camera 106
Andrej Mihálik, Pavol Kunovský, and Roman Ďurikovič

Compression and Aggregation for Optimizing Information Transmission in Distributed CNN 112
Takamasa Mitani, Hisakazu Fukuoka, Yuria Hiraga, Takashi Nakada, and Yasuhiko Nakashima

An Information Platform for Smart Communities Realizing Data Usage Authentication and Secure Data Sharing 119
Akira Niwa and Hiroaki Nishi

A Practical Collision Avoidance Method for an Inter-Chip Bus with Wireless Inductive through Chip Interface 126
Akio Nomura, Jun'ichiro Kadomoto, Tadahiro Kuroda, and Hideharu Amano

SPH-based Fluid Simulation on GPU Using Verlet List and Subdivided Cell-Linked List 132
Kazuhiko Ohno, Tomoki Nitta, and Hiroto Nakai

Blind Watermarking Method for Anonymized Data 139
Yuta Ohno, Tomomu Iwai, and Hiroaki Nishi

Optimization Strategies for WRF Single-Moment 6-Class Microphysics Scheme (WSM6) on Intel Microarchitectures 146
T.A.J. Ouermi, Aaron Knoll, Robert M. Kirby, and Martin Berzins

Generalized-Star Crossed Cube - A Flexible Interconnection Network with High-Performance at Low-Cost 153
Tomofumi Sato and Yamin Li

A Light-Weight Cooperative Caching Strategy by D2D Content Sharing 159
Takayuki Shiroma, Takuma Nakajima, Celumuge Wu, and Tsutomu Yoshinaga

CPCI Stack: Metric for Accurate Bottleneck Analysis on OoO Microprocessors 166
Teruo Tanimoto, Takatsugu Ono, and Koji Inoue

Discovery of δ-Tolerance Closed Subgraphs on GPGPU 173
Tatsuya Toki and Tomonobu Ozaki

A Feasibility Study of Programmable Analog Calculation Unit for Approximate Computing 180
Renyuan Zhang, Takashi Nakada, and Yasuhiko Nakashima

Fifth International Workshop on Applications and Fundamentals of Cellular Automata (AFCA 2017)

AFCA 2017 Regular Papers

Biologically Adaptive Artificial Bee Colony for Numerical Optimization 187
Sheng-Ta Hsieh, Hao-Wen Cheng, Chun-Ling Lin, and Tsung-Ying Sun

Hierarchical Motion Representation of 2-State Number Conserving Cellular Automata 194
GilTak Kong, Katsunobu Imai, and Toru Nakanishi

On a Triangular Brownian Cellular Automaton with 4 States and 6 Rules 200
Yuta Yamatani, Teijiro Isokawa, Jia Lee, and Ferdinand Peper

Fifth International Workshop on Applications and Fundamentals of Cellular Automata (AFCA 2017)

AFCA 2017 Poster Papers

Fractal Structure of a Class of Two-Dimensional Two-State Cellular Automata 205
Akane Kawaharada and Takao Namiki

10th International Workshop on Autonomous Self-Organizing Networks (ASON 2017)

ASON 2017 Regular Papers

A Contention Window Control Method Using Priority Control Based on the Number of Freezes of Wireless LAN 209
Tomoki Hanzawa and Shigetomo Kimura

Dynamic Access-Point Configuration Approach for Elastic Wireless Local-Area Network System 216
Md. Manowarul Islam, Md. Selim Al Mamun, Nobuo Funabiki, and Minoru Kuribayashi

Proposal of a Multi-agent Based Flexible IoT Edge Computing Architecture Harmonizing Its Control with Cloud Computing 223
Shinji Kitagami, Tadashi Ogino, Takuo Suganuma, and Norio Shiratori

Performance Evaluation for the Signature Algorithm of ISDSR on Raspberry Pi 230
Hideharu Kojima and Naoto Yanai

Data Collection Method Using Data Collection with DTN in Participatory Sensing and Data Interpolation 237
Hiro Onishi, Ryuta Mogi, and Takuya Asaka

Effective Suppression of False Rumors in Social Network Service 243
Yuusuke Ookita and Satoshi Fujita

Coded Caching for Hierarchical Networks with a Different Number of Layers 249
Makoto Takita, Masanori Hirotomo, and Masakatu Morii

Game Theory-Based Power Allocation and Channel Selection of Multi-channel D2D 256
Aunee Azrina Zulkifli, Kaori Kuroda, and Mikio Hasegawa

10th International Workshop on Autonomous Self-Organizing Networks (ASON 2017)

ASON 2017 Poster Papers

Peer-to-Peer Bidirectional Streaming Using Mobile Edge Computing 263
Taichiro Nakayama and Takuya Asaka

Evaluation of Information Dissemination Scheme Using Autonomous Clustering and Epidemic Routing Considering Mobile Core Network Load in Wireless Networks 267
Toshikazu Terami, Tomoyuki Ohta, and Yoshiaki Kakuda

Fifth International Workshop on Computer Systems and Architectures (CSA 2017)

CSA 2017 Regular Papers

Configurable Fast Cycle-Approximate Timing Estimation for Instruction-Level Emulators 271
Tzu-Yi Chang, Chung-Ta King, Bhaskar Das, and Bo-Hao Liao

FEBRE: A Fast and Efficient Bit-Flipping Reduction Technique to Extend PCM lifetime 277
Peng Gao, Dongsheng Wang, and Haixia Wang

MemSpaces: Evaluating the Tuple Space Paradigm in the Context of Memory-Centric Architectures 284
Andreas Grapentin, Max Plauth, and Andreas Polze

Logarithmic Compression for Memory Footprint Reduction in Neural Network Training 291
Kazutoshi Hirose, Ryota Uematsu, Kota Ando, Kentaro Orimo, Kodai Ueyoshi, Masayuki Ikebe, Tetsuya Asai, Shinya Takamaeda-Yamazaki, and Masato Motomura

Optimising Scientific Workflow Execution Using Desktops, Clusters and Clouds 298
Edvard Martins de Oliveira, Júlio Cézar Estrella, Fausto Guzzo da Costa, Alexandre Claudio Botazzo Delbem, and Stephan Reiff-Marganiec

Time-Sharing Multithreading on Stream-Based Lossless Data Compression 305
Koichi Marumo and Shinichi Yamagiwa

Automated Tiered Storage System Consisting of Memory and Flash Storage to Improve Response Time with Input-Output (IO) Concentration Workloads 311
Kazuichi Oe, Mitsuru Sato, and Takeshi Nanri

Topological Properties and Routing Algorithm for the Static K-ary N-tree Interconnection Network 318
Masahiro Tozaki and Yamin Li

Fifth International Workshop on Computer Systems and Architectures (CSA 2017)

CSA 2017 Poster Papers

An Obfuscated Hardwired Sequence Control System Generated by High Level Synthesis 323
Yoshiki Ishigaki, Naoki Fujieda, Yuumi Matsuoka, Kazuki Uyama, and Shuichi Ichikawa

Power Measurement and Modeling of Quadcopters on Horizontal Flight 326
Kotaro Maekawa, Shunsuke Negoro, Ittetsu Taniguchi, and Hiroyuki Tomiyama

Second International Workshop on GPU Computing and Applications (GCA 2017)

GCA 2017 Regular Papers

GUNREAL: GPU-accelerated UNsupervised REinforcement and Auxiliary Learning 330
Youri Coppens, Koichi Shirahata, Takuya Fukagai, Yasumoto Tomita, and Atsushi Ike

Is Emulating "Binary Grep in Eyes" Possible with Machine Learning? 337
Mamoru Mimura, Yuhei Otsubo, Hidema Tanaka, and Atsuhiro Goto

CloudCL: Distributed Heterogeneous Computing on Cloud Scale 344
Max Plauth, Florian Rösler, and Andreas Polze

High Performance and Low Power Architectures: GPU vs. FPGA for Fast Factorized Backprojection 351
M. Wielage, F. Cholewa, C. Fahnemann, P. Pirsch, and H. Blume

Second International Workshop on GPU Computing and Applications (GCA 2017)

GCA 2017 Poster Paper

Improving Multiple Precision Integer Multiplication on GPUs 358
Makoto Miyazaki and Susumu Matsumae

Fifth International Workshop on Legacy HPC Application Migration (LHAM 2017)

LHAM 2017 Regular Papers

Mixed Precision Solver Scalable to 16000 MPI Processes for Lattice Quantum Chromodynamics Simulations on the Oakforest-PACS System 362
Taisuke Boku, Ken-Ichi Ishikawa, Yoshinobu Kuramashi, and Lawrence Meadows

Designing an Open Database of System-Aware Code Optimizations 369
Ryusuke Egawa, Kazuhiko Komatsu, and Hiroyuki Takizawa

Practical Implementation of Lattice QCD Simulation on Intel Xeon Phi Knights Landing 375
Issaku Kanamori and Hideo Matsufuru

Embedded-DSL-Like Code Generation and Optimization of Bayesian Estimation Routines with User-Defined Source-to-Source Code Transformation Framework Xevolver 382
Reiji Suda

An Application-Level Incremental Checkpointing Mechanism with Automatic Parameter Tuning 389
Hiroyuki Takizawa, Muhammad Alfian Amrizal, Kazuhiko Komatsu, and Ryusuke Egawa

Ninth International Workshop on Parallel and Distributed Algorithms and Applications (PDAA 2017)

PDAA 2017 Regular Papers

Discrete Periodic Radon Transform Based Weighted Nuclear Norm Minimization for Image Denoising 395
Budianto and Daniel P.K. Lun

Synchronizing Parallel Geometric Algorithms on Multi-core Machines 401
Joel Fuentes, Fei Luo, and Isaac D. Scherson

An Asynchronous P System Using Branch and Bound for the Satisfiability Problem 408
Yuki Jimen and Akihiro Fujiwara

An Asynchronous Message-Passing Distributed Algorithm for the Global Critical Section Problem 414
Sayaka Kamei and Hirotsugu Kakugawa

A Verified Accumulate Algorithmic Skeleton 420
Frédéric Loulergue

Estimating Power Consumption of Servers Using Gaussian Mixture Model 427
Hao Zhu, Huadong Dai, Shazhou Yang, Yuejin Yan, and Bin Lin

Fourth International Workshop on Information and Communication Security (WICS 2017)

WICS 2017 Regular Papers

Fingerprinting BitTorrent Traffic in Encrypted Tunnels Using Recurrent Deep Learning 434
Michelangelo Cruz, Roel Ocampo, Isabel Montes, and Rowel Atienza

A Method for Constructing an Autonomous Decentralized P2P Storage with High Confidentiality and Reliability 439
Masayuki Fukumitsu, Shingo Hasegawa, Shuji Isobe, Jun-ya Iwazaki, Eisuke Koizumi, and Masao Sakai

An ECC Implementation with a Twisted Montgomery Curve over Fq32 on an 8-Bit Microcontroller 445
Yuta Hashimoto, Md. Al-Amin Khandaker, Yuta Kodera, Taehwan Park, Takuya Kusaka, Howon Kim, and Yasuyuki Nogami

An Efficient Implementation of Trace Calculation over Finite Field for a Pseudorandom Sequence 451
Yuta Kodera, Takuya Kusaka, Takeru Miyazaki, Md. Al-Amin Khandaker, Yasuyuki Nogami, and Satoshi Uehara

Long-Term Performance of a Generic Intrusion Detection Method Using Doc2vec 456
Mamoru Mimura and Hidema Tanaka

Performance Improvement and Evaluation of Function for Tracing Diffusion of Classified Information on KVM 463
Hideaki Moriyama, Toshihiro Yamauchi, Masaya Sato, and Hideo Taniguchi

Implementation of Hash Function Generator on Schematic to Program Translator(SPT) 469
Toshihiro Nakamura, Keisuke Iwai, Takashi Matsubara, and Takakazu Kurokawa

Implementation of High Speed Hash Function Keccak Using CUDA on GTX 1080 475
Thuong Nguyen Dat, Keisuke Iwai, and Takakazu Kurokawa

Optimal Representation for Right-to-Left Parallel Scalar Point Multiplication 482
Kittiphon Phalakarn, Kittiphop Phalakarn, and Vorapong Suppakitpaisarn

Implementation of Revocable Group Signatures with Compact Revocation List Using Vector Commitments 489
Shahidatul Sadiah and Toru Nakanishi

Designated-Senders Public-Key Searchable Encryption Secure against Keyword Guessing Attacks 496
Takanori Saito and Toru Nakanishi

Mocha: Automatically Applying Content Security Policy to HTML Hybrid Application on Android Device 503
Toshiki Takeuchi, Koichi Mouri, and Shoichi Saito

Analysis of Effectiveness of Slow Read DoS Attack and Influence of Communication Environment 510
Shunsuke Tayama and Hidema Tanaka

Biometric Bit String Generation from Handwritten Initials on Smart Phones 516
Ryo Yamagami and Yasushi Yamazaki

Packet in Message Based DDoS Attack Detection in SDN Network Using OpenFlow 522
Xiang You, Yaokai Feng, and Kouichi Sakurai

Fourth International Workshop on Information and Communication Security (WICS 2017)

WICS 2017 Poster Papers

Access Control of Webcam on PC with Prevention against Peeping by Attackers 529
Yuri Yoshino and Masaki Inamura

Effectively Protect Your Privacy: Enabling Flexible Privacy Control on Web Tracking 533
Shiqian Yu, Danilo Vasconcellos Vargas, and Kouichi Sakurai

Eighth International Workshop on Advances in Networking and Computing (WANC 2017)

WANC 2017 Short Papers

Messaging Protocol for Relaying Messages between Participants with Autonomous Distributed Blockchain Propagation 537
Hiroyoshi Ichikawa and Aki Kobayashi

The Entering and Exiting Management System by Person Specification Using Deep-CNN 542
Hiroto Kizuna and Hiroyuki Sato

Wind-Aware Emergency Landing Assistant Based on Dubins Curves 546
Marius Klein, Andreas Klos, Jörg Lenhardt, and Wolfram Schiffmann

Label Estimation Method with Modifications for Unreliable Examples in Taming 551
Yasutake Koishi, Shuichi Ishida, Tatsuo Tabaru, and Hiroyuki Miyamoto

A Deletion Aware Usable Space Control for SD2 555
Joichiro Kon, Kenji Nakashima, and Saneyasu Yamaguchi

Estimation of Power Consumption of Each Application Caused by Device Lock Considering Software Dependency in Smartphones 560
Shun Kurihara, Shoki Fukuda, Masato Oguchi, and Saneyasu Yamaguch

Cooperative Jamming in a Two-Hop Relay Wireless Network with Buffer-Aided Relays 565
Kenta Sasaki, Xuening Liao, and Xiaohong Jiang

A Study of TRAX Player by Template Matching 570
Masataka Nakano and Yoshiki Yamaguchi

A Translation Method of ARM Machine Code to LLVM-IR for Binary Code Parallelization and Optimization 575
Kohta Shigenobu, Kanemitsu Ootsu, Takeshi Ohkawa, and Takashi Yokota

A Study on the Performance of Web Applications Based on RoR in a Highly Consolidated Server with Container-Based Virtualization 580
Yuto Tachibana, Joichiro Kon, and Saneyasu Yamaguchi

Study on Reduction on Average Computational Complexity of GMD Decoding Using Property of Bounded Distance Decoding 584
Shunsuke Ueda and Takuya Kusaka

Acceleration of Large-Scale CGH Generation Using Multi-GPU Cluster 589
Shinpei Watanabe, Boaz Jessie Jackin, Takeshi Ohkawa, Kanemitsu Ootsu, Takashi Yokota, Yoshio Hayasaki, Toyohiko Yatagai, and Takanobu Baba

Eighth International Workshop on Advances in Networking and Computing (WANC 2017)

WANC 2017 Poster Papers

A Firefly Optimization for a Connected Dominating Set in a Sensor Network 594
Yuta Matsumoto and Akihiro Fujiwara

Performance Evaluation of File Operations on OverlayFS 597
Naoki Mizusawa, Kenji Nakazima, and Saneyasu Yamaguchi

A Study of a Fault-Tolerant System Using Dynamic Partial Reconfiguration 600
Seiya Ogido, Chikatoshi Yamada, Kei Miyagi, and Shuichi Ichikawa

A Study on Direction Estimation of Movement by Multiple Sensors for Pedestrian Dead-Reckoning 603
Yuya Sakuma and Masahiro Fujii

Examination of Classifying Hoaxes over SNS Using Bayesian Network 606
Ryutaro Ushigome, Takeshi Matsuda, Michio Sonoda, and Jinhui Chao

A Study to Optimize Heterogeneous Resources for Open IoT 609
Yoji Yamato, Naoto Hoshikawa, Hirofumi Noguchi, Tatsuya Demizu, and Misao Kataoka

Author Index 612