2020 Eighth International Symposium on Computing and Networking Workshops (CANDARW 2020)

Naha, Japan 24 – 27 November 2020



IEEE Catalog Number: ISBN:

CFP20S28-POD 978-1-7281-8931-4

Copyright © 2020 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:
 CFP20S28-POD

 ISBN (Print-On-Demand):
 978-1-7281-8931-4

 ISBN (Online):
 978-1-7281-9919-1

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



2020 Eighth International Symposium on Computing and Networking Workshops (CANDARW)

CANDARW 2020

Table of Contents

Message from the CANDARW 2020 Organizers xv
ASON 2020 Workshop Organizers xvi
CSA 2020 Workshop Organizers .xvii
GCA 2020 Workshop Organizers xviii
LHAM 2020 Workshop Organizers xix.
PDAA 2020 Workshop Organizers .xx.
SUSCW 2020 Workshop Organizers .xxi
WICS 2020 Workshop Organizers xxii
WANC 2020 Workshop Organizers xxiii.
Reviewers xxiv
13th International Workshop on Autonomous Self-Organizing Networks (ASON'20)
Regular Papers
A Generalization of Transmission Power Optimization Method for Concurrently Communicating Multiple Access-Points in Wireless Local-Area Network 1. Hendy Briantoro (Okayama University), Nobuo Funabiki (Okayama University), Kwenga Ismael Munene (Okayama University), Md. Mahbubur Rahman (Okayama University), Fatema Akhter (Okayama University), Minoru Kuribayashi (Okayama University), and Wen-Chung Kao (National Taiwan Normal University)
Evacuation Route Guidance Scheme for Building Evacuation Using Wireless Mesh Network Systems .8
(Hiroshima City University), and Yoshiaki Kakuda (Hiroshima City University)
Evaluation on Progressive Download Methods Based on Timer-Driven Requesting Schemes on Multiple Paths with Shared Links .14
Realtime Congestion Forecasting of Remote SPace through BLE Beacons .21

A New Model of Flaming Phenomena in Online Social Networks That Considers Resonance Driven by External Stimuli .28.
Tomoya Kinoshita (Tokyo Metropolitan University) and Masaki Aida (Tokyo Metropolitan University)
A Study on Adjacent Interference of LoRa .35 Jinshan Luo (Utsunomiya University), Atsushi Ito (Utsunomiya University), Akira Sasaki (Utsunomiya University), Madoka Hasegawa (Utsunomiya University), Yoshikazu Nagao (Utsunomiya University), Yuko Hiramatsu (Chuo University), Kotaro Torii (Chuo University), Shiori Ashibe (Tokyo University of Agriculture and Technology), and Toru Aoki (Tochigi Prefecture Dairy Co-operative)
3D Maps Distribution of Self-Driving Vehicles Using Roadside Edges .40. Masaya Mizutani (The University of Tokyo), Manabu Tsukada (The University of Tokyo), Yuki Iida (Tier IV, Inc.), and Hiroshi Esaki (The University of Tokyo)
Throughput Characteristics Evaluation of Media Access Control Sp-MAC in Multi-Hop WLAN Environment Considering Capture Effect .46
Evaluation of Disaster Information-Sharing System in Various Situations .53. Kaito Shibutani (Kogakuin University), Kentaro Mizunaga (Kogakuin University), Utsav Shrestha (Kogakuin University), and Aki Kobayashi (Kogakuin University)
Blackhole Attack Cooperative Prevention Method in MANETs .60 Takeru Terai (Ritsumeikan University), Masami Yoshida (Ritsumeikan University), Alberto Gallegos Ramonet (Ritsumeikan University College of Inf. Sci. Eng.), and Taku Noguchi (Ritsumeikan University College of Inf. Sci. Eng.)
Adaptive Link Rate Switching Based on Traffic Splitting Method for Power Saving .67
8th International Workshop on Computer Systems and Architectures (CSA'20)
Regular Papers
Parameter Optimization of Approximate Image Processing Algorithms in FPGAs 74
FPGA Context-Based Live Migration Maintaining Network Consistency .81

A Translator from FDL to Systemverilog for FPGA Implementation of Fuzzy Inference .87
Layout-Oriented Low-Diameter Topology for HPC Interconnection Networks .93
Resource Utilization Prediction Model for SLAM Offload to Edge .100. Koki Nagahama (Shibaura Institute of Technology), Yoichi Ishiwata (Ales Inc.), and Midori Sugaya (Shibaura Institute of Technology)
FPGA Acceleration of ROS2-Based Reinforcement Learning Agents .106
Poster Papers
Speeding Up VBGMM by Using Logsumexp with the Approximate Exp-Function .113
Netlist-Based Measures for Hardware Obfuscation: A Preliminary Study .116
5th International Workshop on GPU Computing and AI (GCA'20)
Regular Papers
Predicting Smartphone Users' Future Locations through Deep Reinforcement Learning .120
Image Classification with Additional Non-Decision Labels Using Self-Supervised Learning and GAN .125.
Toshiki Hatano (KanazawaUniversity), Tsuneda Toy (Kanazawa University), Yuta Suzuki (Kanazawa University), Kouske Shintani (Kanazawa University), and Satoshi Yamane (KanazawaUniversity)
Distributed Deep Learning of Resnet50 and VGG16 with Pipeline Parallelism .130

Copic and Sentiment Analysis Matrix Factorization on Rating Prediction for Recommendation .137. Ben Wang (Advanced Science and Engineering, Hiroshima University), Guan-Shen Fang (National Institute of Technology, Tsuyama College), and Sayaka Kamei (Advanced Science and Engineering, Hiroshima University)
tefining Similarity Matrices to Cluster Attributed Networks Accurately .1.44
art Font Image Generation with Conditional Generative Adversarial Networks .151
Automated Test Input Generation for Convolutional Neural Networks by Implementing Multi-Objective Evolutionary Algorithms .157
oster Papers
an Efficient Skinny Matrix-Matrix Multiplication Method by Folding Input Matrices into ensor Core Operations 164
Model-Based Reinforcement Learning with Missing Data 168
th International Workshop on Large-scale HPC Application Modernization (LHAM'20)
Regular Papers
mproving the Accuracy in SpMV Implementation Selection with Machine Learning .172 Reo Furuhata (Tohoku University), Minglu Zhao (Tohoku University), Mulya Agung (Tohoku University), Ryusuke Egawa (Tokyo Denki University), and Hiroyuki Takizawa (Tohoku University)
Performance EVAluation of Accurate Matrix–Matrix Multiplication on GPU Using Sparse Matrix Multiplications .178
Openfc: A Portable Toolkit for Custom FPGA Accelerators and Clusters .185

Modernising an Industrial CFD Application 191. István Reguly (Pázmány Péter Catholic University) and Gihan Mudalige (University of Warwick)
12th International Workshop on Parallel and Distributed Algorithms and Applications (PDAA'20)
Regular Papers
Enhanced Use of Mixed-Mode Clock Manager for Coherent Sampling-Based True Random Number Generator 197. Naoki Fujieda (Aichi Institute of Technology) and Sogo Takashima (Aichi Institute of Technology)
Closed-Form Solutions of the Fundamental Equation that Describes User Dynamics in Online Social Networks 204
Implementing a Multi-Ejection Switch and Making the Use of Multiple Lanes in a Circuit-Switched Multi-FPGA System 211. Kohei Ito (Keio University), Kensuke Iizuka (Keio University), Kazuei Hironaka (Keio University), Yao Hu (National Institute of Informatics), Michihiro Koibuchi (National Institute of Informatics), and Hideharu Amano (Keio University)
A Diagonal Checksum Algorithm-Based Fault Tolerance for Parallel Matrix Multiplication 218 Ke Cui (The Graduate University for Advanced Studies) and Michihiro Koibuchi (National Institute of Informatics)
Transparent Transaction Processing with a High-Performance Proxy for Distributed KVS .224 Ryuya Miwa (Nagoya Institute of Technology), Motoshi Miyamoto (Nagoya Institute of Technology), Ryota Kawashima (Nagoya Institute of Technology), and Hiroshi Matsuo (Nagoya Institute of Technology)
An Asynchronous P System with Branch and Bound for Solving the Knapsack Problem .230 Yoshikata Nakano (Kyushu Institute of Technology) and Akihiro Fujiwara (Kyushu Institute of Technology)
Link Fault Tolerant Routing Algorithms in Mirrored K-Ary N-Tree Interconnection Networks .237. Yaodong Wang (Hosei University) and Yamin Li (Hosei University)
A Parallel Volunteer Computing Based on Server Assisted Communications 242 Yuto Watanabe (Yamaguchi University) and Masaru Fukushi (Yamaguchi University)
3rd Sustainable Computing Systems Workshop (SUSCW'20)
Regular Papers
Cluster Analysis of Psychological Characteristics in Elite Level Rugby Players Who Belong to Companies 248

Noble Inheritance Mechanism of Digital Content for "Digital-Ji-In" toward Sustainable Society 254
Reducing the Effect of a Human Body for Position Estimation Using Ibeacon .260. Takayuki Miyazaki (Tottori University), Takehiro Makita (VOYAGE GROUP, Inc.), Kenichi Takahashi (Cross-Informatics Research Center, Tottori University), Takao Kawamura (Cross-Informatics Research Center, Tottori University), and Kazunori Sugahara (Cross-Informatics Research Center, Tottori University)
Assessment of Consumers' Acceptability of Life Infrastructure Service Interruption and Their Factors 267
Programming Learning by Creating Problems 27.2 Minoru Uehara (Toyo University)
Horizontal Division of Deep Learning Applications with All-to-All Communication on a Multi-FPGA System 277. Yugo Yamauchi (Keio University), Akram Ben Ahmed (Keio University), Kazuei Hironaka (Keio University), Kensuke Iizuka (Keio University), and Hideharu Amano (Keio University)
Poster Papers
CLAHE Implementation on a Low-End FPGA Board by High-Level Synthesis .282
Fault Tolerance Evaluation of Small World Networks for VLSI Implementation .286
Toward Autonomous Adaptive Embedded Systems for Sustainable Services Using Reinforcement Learning (Wip Report) .290
An Implementation of a Grid Square Codes Generator on a RISC-V Processor 294. <i>Jubee Tada (Yamagata University) and Keiichi Sato (Yamagata College of Industry and Technology)</i>
Proposal of a Smart Bicycle Tourism Improving Tourability and Safety for Tourists by Mesh LPWA Communication System .298

7th International Workshop on Information and Communication Security (WICS'20)

Regular Papers

Improvement of Bit Distribution of Binary Sequence Generated by Alternative Trace Map Function 302. Fatema Akhter (Okayama University), Tomoya Tatara (Okayama University), Yasuyuki Nogami (Okayama University), Takuya Kusaka (Okayama University), and Nobuo Funabiki (Okayama University)
Quantum Security and Implementation Evaluation of Non-Adaptive Group-Testing Aggregate Message Authentication Codes .307. Hiroaki Anada (University of Nagasaki) and Daiki Kamibayashi (University of Nagasaki)
An Accumulator-Based Revocation in Delegatable Anonymous Credentials .314
A Tightly Secure DDH-Based Multisignature with Public-Key Aggregation .321
Method of Generating a Blacklist for Mobile Devices by Searching Malicious Websites .328
A New Feature to Secure Web Applications .334
Dataset Properties and Degradation of MAChine Learning Accuracy with an Anonymized
Training Dataset 341
Specific Congruence Classes of Integer Parameters for Generating BLS Curves for Fast
Pairings 348
New Approach to Dishonest-Majority Secure Multiparty Computation for Malicious Adversaries When $N < 2k - 1$.355
Shogo Ochiai (Tokyo University of Science) and Keiichi Iwamura (Tokyo University of Science)
Information Security Fatigue Countermeasures Based on Cognitive Strategy Scale .362
An Approach for Attacking Speck on Microcontroller with Correlation Power Analysis .368 Jianjie Tang (Okayama University), Kengo Iokibe (Okayama University), Takuya Kusaka (Okayama University), and Yasuyuki Nogami (Okayama University)

Towards a Secure Proxy-Based Architecture for Collaborative AI Engineering
Enhanced Classification Method for Homograph Attack Detection
Poster Paper
SUESSA: Sustainable & Ultra-Elastic Stack Security Architecture for Securing IoT Networks of Future Smart Cities
11th International Workshop on Advances in Networking and Computing (WANC'20)
Short Papers
RNN-Based Approach to TCP Throughput Prediction 39: Luyao Bai (University of Tsukuba), Hirotake Abe (University of Tsukuba), and Chunghan Lee (Toyota Motor Corporation)
A Hybrid Solution for Pattern Recognition Face and Speech
A Study of FPGA-Based Cluster Computing by High-SPeed Serial-Link Communication
Tweet Classification Using Conversational Relationships
Development of Soft-Core Processor with Efficient Array Data Transfer Mechanism
A Conflict-Aware Capacity Control Mechanism for Last-Level Cache

Cache Replacement Based on LSTM in the Second Cache in Virtualized Environment .421
Prototype Implementation of Flat Naming Scheme ICN on Cefore as the CCN Platform .425 Kentaro Mizunaga (Kogakuin University) and Aki Kobayashi (Kogakuin University)
An Asynchronous P System for Counting Sort .430
Transient Pattern Detection from Streaming Nature Data .435. Thanapol Phungtua-eng (Rajamangala University of Technology Tawan-Ok Chakrabongse Bhuvanarth Campus), Yoshitaka Yamamoto (Shizuoka University), and Shigeyuki Sako (University of Tokyo)
Category-Oriented Sentiment Polarity Dictionary for Rating Prediction of Japanese Hotels .440 Akito Shibata (HIROSHIMA University), Sayaka Kamei (HIROSHIMA University), and Koji Nakano (HIROSHIMA University)
An FPGA Implementation of a Gaussian Process Based Predictor for Sequential Time Series Data .445
Device Position Estimation for Multi-Tablet Virtual Display System 450. Hiroto Suzuki (Kogakuin University), Gaichi Kawaai (Kogakuin University), Toshiyuki Fujita (Kogakuin University), and Aki Kobayashi (Kogakuin University)
A Study of Value Trace Problems for Code Reading Study of C Programming .455
Proposal of Automatic Offloading Method in Mixed Offloading Destination Environment .460 Yoji Yamato (NTT Corporation)
Poster Papers
Efficient Exploration by Decision Making Considering Curiosity and Episodic Memory in Deep Reinforcement Learning .465
Real-Time Detection of Foreign Substance in Seaweed Using Pushbroom Hyperspectral Imaging .468 Donghoon Kwak (DGIST), Gukjin Son (DGIST), and Youngduk Kim (DGIST)
Generating and Analyzing Data Set of Workflow-Nets 471. Shohei Matsubara (Yamaguchi University), Shingo Yamaguchi (Yamaguchi University), and Mohd Anuaruddin Bin Ahmadon (Yamaguchi University)

A Peak-Avoidance Scheme for Chasing Playback of Mobile Live Streaming .47.4 Hiroki Okada (The University of Electro-Communications), Masato Yoshimi (TIS Inc.), Celimuge Wu (The University of Electro-Communications), and Tsutomu Yoshinaga (The University of
Electro-Communications)
Puyo Puyo AI Using Monte Carlo Tree Search 477. Katsutoshi Soejima (Saga University), Nobuhiko Yamaguchi (Saga University), Osamu Fukuda (Saga University), and Hiroshi Okumura (Saga University)
Detection of Foreign Objects Overlapped to Green Onion Flakes .480
An Image Classification Model That Learns MNIST Image Features and Numerical Information .483 Yuta Suzuki (Kanazawa University), Toshiki Hatano (Kanazawa University), Toi Tsuneda (Kanazawa University), and Satoshi Yamane (Kanazawa University)
Location Estimation Algorithm Using UAV for Real Environments .486
Q-Learning in Continuous Action Space by Extending EVA .489. Toi Tsuneda (Kanazawa University), Daiki Kuyoshi (Kanazawa University), and Satoshi Yamane (Kanazawa University)
Author Index 493.