# 2017 Twelfth International Conference on Digital Information Management (ICDIM 2017)

Fukuoka, Japan 12 – 14 September 2017



IEEE Catalog Number: ISBN: CFP17DIM-POD 978-1-5386-0665-0

## 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:	CFP17DIM-POD
ISBN (Print-On-Demand):	978-1-5386-0665-0
ISBN (Online):	978-1-5386-0664-3

#### 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





**IEEE** 

### The Twelfth International Conference on Digital Information Management (ICDIM 2017) Kyushn University, Fukuoka, Japan

September 12- 14, 2017

Proceedings will be indexed in IEEE Xplore

#### Contents

Artificial Intelligence	Future Big Data	
Data Management	E-Learning and E Government	
Mobile Network Security and Access Control	Mobile Data Management	
Natural Language Processing and Information Retrieval	Data Mining and Data Warehousing	
Knowledge Manageament	Information Visulaization	
Web Services and Web Metrics	Image Processing	
Workshop on DIWM		

Modelling Swarm-Intelligent Systems for Medical Applications1	
Jolanta MIZERA-PIETRASZKO	
Artificial Intelligence	
Code Style Analytics for the Automatic Setting of Formatting Rules in IDEs A Solution to the Tabs vs. Spaces Debate6	
Eric Torunski, M. Omair Shafiq, Anthony Whitehead	
Analysis of Criminal Behaviors for Suspect Vehicle Detection15	
Ubon Thongsatapornwatana, Woraphon Lilakiatsakun, Akkarach Kawbunjun, Tossapon Boongoen	
Shortest Path Deliveries Using Density-Based Clustering21	
Lixin Fu	
Classification of Computer Viruses from Binary Code using Ensemble Classifier and Recursive Feature Elimination27	
Prasit Usaphapanus, Krerk Piromsopa	
Factor Analysis of Investment Trust Products by Using Monthly Reports and News Articles32	
Nobuaki Onishi, Qiang Ma	
Analyzing Patterns of Numerously Occurring Heart Diseases Using Association Rule Mining38	
K.M. Mehedi Hasan Sonet, Md. Mustafizur Rahman, Pritom Mazumder, Abid Reza, Rashedur M Rahman	
Future Big Data	
Prediction of Importance of Figures in Scholarly Papers46	
Yui Kita, Jun Rekimoto	
Fast Plagiarism Detection Based on Simple Document Similarity54	
Kensuke Baba	
CRF-Based Bibliography Extraction from Reference Strings Using a Small Amount of Training Data59	
Daiki Namikoshi, Manabu Ohta, Atsuhiro Takasu, Jun Adachi	
Stock Prices Fluctuation Analysis of Food Companies After the Great East-Japan Earthquake: Application of Random Matrix Theory65	
Kenji Yamaguchi, Yukari Shirota	
Data Management	
An Improved Algorithm for Transmission in Heterogeneous Cellular Networks70	
Yao-Liang Chung	
A Collaborative Filtering Method for Interactive Platforms75	

A Migration-oriente	d Partial Adaptation Architecture for IoT-empowered City Platform as a Service81
Toshihiko Yamakam	ii
	E-Learning and E Government
National Survey of J	Japanese Universities on Computing Education: Analysis of Non-IT Departments and Courses86
Tetsuro Kakeshita	
National Servey of J	apanese Universities on Computing Education: Analysis of IT Education for High School Teacher License on IT92
Kazuhiro Sumi, Tets	suro Kakeshita
Compliance Evaluat	ion of Information Privacy Protection in e-Government Systems in Anglophone West Africa using ISO/IEC 29100:201198
Amarachi Chinwenc	lu Nwaeze, Pavol Zavarsky, Ron Ruhl
National Survey of J	Japanese Universities on Computing Education: Analysis of Educational Computer System103
Mika OHTSUKI, Te	etsuro KAKESHITA, Mitsuhiro TAKASAKI
National Survey of J	lapanese Universities on Computing Education: Analysis of Informatics in General Education109
Naoko Takahashi, Te	
,	Mobile Network Security and Access Control
A HTTP Botnet Det	ection System Based on Ranking Mechanism115
	ian-Mu Tseng, Tzong-Jye Liu
	liance Evaluation of Cookies-Setting Websites with Privacy Protection Laws121
	, Pavol Zavarsky, Neelam Memon
	Conference Key Distribution Protocol127
	zu-Wei Lin, Huang-Chia Lu, Tzu-Hsien Chuang, Yu-Han Chen
	End-to-End Authentication Key Exchange Protocol for IoT Environments133
	zu-Wei Lin, Yu-Han Chen, Tzu-Wei Lin, Huang-Chia Lu
<b>.</b>	Authentication Scheme for Multi-Gateway Wireless Sensor Networks139
	k Jung, Dongwoo Kang, Hyoungshick Kim, Dongho Won
<u> </u>	of end users in enterprise SOA using combinatorial group testing methods144
Siba Mishra, Chiran	
Siba Misira, Cimai	Mobile Data Management
Minimum nodo woje	2ht spanning trees searching algorithm for broadcast transmission in sensor networks150
Zbigniew Lipinski	git spanning uces searching argorithm for broadcast transmission in sensor networks150
<u> </u>	y of Devices on the Internet using OpenFlow155
	ira, Peron R. de Sousa, Antonio A. de A. Rocha, Pedro B. Velloso
	ganizing Context Logs for Mobile User Profiling161
0 0,	ing-Yuan Cheny, Huan Chen, Yao-Chung Fan
	Migration for VOD Service165
	Iao-Xiang Gu, Jhih-Ying Yan, Mong-Fong Horng
	em for Thai Food Cooking on Smartphone169
Hathairat Ketmanee	chairat, Chutima Kongketwanich, Thitinun Naijit
	Natural Language Processing and Information Retrieval
· · ·	APIs for Building Arabic Systems175
	mdi, Joharah Khabti, Hend S. Al-Khalifa
	ification of Mathematical Expressions179
	in, Ryan Vrecenar, Jyh-Charn Liu
	ence of Semantic Knowledge in Natural Language Generation185
Cristina Barros, Eler	
Two-level Dynamic	Index Pruning191
Jan Friedrich, Christ	toph Lindemann, Michael Petrifke
Mobile Search Engi	ne for Medicine Information on Smartphone197
Hathairat Ketmanee	chairat, Kittithud Jongsiriworachot, Chanatip Thangtoon
Toward Plagiarism I	Detection Using Citation Networks202
Sidik Soleman, Atsu	ıshi Fujii
· · · · · ·	ocial Media Datasets in Message Filtering Systems209

Dete Mining and Dete Wenthereing
Data Mining and Data Warehousing
Item Recommending by Item Co-purchasing Network and User Preference216
Sunantha Sodsee, Maytiyanin Komkhao
Mining Affordance-based Substitution Rules: A Dynamic Taxonomy Approach222
Rupal Sethi, B Shekar
DIO: Efficient Interactive Outlier Analysis over Dynamic Datasets228
Chihiro Sakazume, Hiroyuki Kitagawa, Toshiyuki Amagasa
Mining and Ranking of Generalized Multi-Dimensional Frequent Subgraphs236
Andre Petermann , Giovanni Micale, Giacomo Bergami, Alfredo Pulvirenti, Erhard Rahm
Urban park area feasibility analysis using fuzzy aggregation of multi-spatial criteria and multi-expert weights246
Arif Wicaksono, Sunya Sarapirome
Can you trust the user? Collaborative Trust Estimation Model for Recommendations252
Daichi Minami, Taketoshi Ushiama
Knowledge Manageament
Rumor Verifications on Facebook: Click Speech of Likes, Comments and Shares257
Alton Y. K. Chua, Snehasish Banerjee
Message Content in the Life of Rumors: Comparing Three Rumor Types263
Alton Y. K. Chua, Rajiv Aricat, Dion Goh
Scientific Visualizer in personal information management269
Grzegorz Osinski, Veslava Osinska, Brian Camacho
Measuring uncertainty to identify missing customer information relevant to the design process273
Anna Martí Bigorra
Information Visulaization
Mining and Visualization of Interpersonal Interaction Networks
SeungJin Lim
Measurement and Analysis of Citizens Requests to Government for Non-Emergency Services286
Rami Ibrahim, M. Omair Shafiq
DREAM: Dynamic data Relation Extraction using Adaptive Multi-agent systems292
Elhadi Belghache, Jean-Pierre George, Marie-Pierre Gleizes
Web Services and Web Metrics
Prototyping a Recommendation System for Ukiyo-e using Hybrid Recommendation Algorithm298
Pritish Patil, Jiayun Wang, Yuya Aratani, Kyoji Kawagoe
Toward Positioning IoT-empowered Service Engineering in City Platform as a Service304
Toshihiko Yamakami
Tweets of Thailand: A Tweet Retrieval System for Domestic Tourism in Thailand309
Rangsipan Marukatat, Nutthapon Chinchaipong, Sirapop Prechalertpririya
Identification of Opinion Leader on Rumor Spreading in Online Social Network Twitter Using Edge Weighting and Centrality Measure Weighting 313
Fatia Kusuma Dewi, Satrio Baskoro Yudhoatmojo, Indra Budi
Image Processing
Improvement of Complete Malaria Cell Image Segmentation319
Monlica Wattana, Tipwalee Boonsri
Offline Touched Cursive Script Segmentation Based on Pixel Intensity Analysis: Character segmentation based on pixel intensity analysis324
Amjad Rehman
Workshop on DIWM
Analysis Based on Japanese Accented English Characteristics Categories for Objective Evaluation328
Hajime Tsubaki
A Content-Constrained Spatial Model for Layout Analysis of Mathematical Expressions334
Xing Wang, Jyh-Charn Liu