

# **2020 IEEE 36th International Conference on Data Engineering Workshops (ICDEW 2020)**

**Dallas, Texas, USA  
20 – 24 April 2020**



**IEEE Catalog Number: CFP2045A-POD  
ISBN: 978-1-7281-4267-8**

**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:	CFP2045A-POD
ISBN (Print-On-Demand):	978-1-7281-4267-8
ISBN (Online):	978-1-7281-4266-1
ISSN:	1943-2895

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2020 IEEE 36th International Conference on Data Engineering Workshops (ICDEW) ICDEW 2020

## Table of Contents

Message from the Chairs .....	viii
Organizing Committee .....	xi
Message from the SMDB 2020 Chairs .....	xiii
SMDB 2020 Organization .....	xv
SMDB 2020 Keynotes .....	xvi

## The Second International Workshop on Blockchain and Data Management (BlockDM 2020)

Block Interval Adjustment toward Fair Proof-of-Work Blockchains .....	1
<i>Reiki Kanda (Tokyo Institute of Technology) and Kazuyuki Shudo (Tokyo Institute of Technology)</i>	
Towards Eidetic Blockchain Systems with Enhanced Provenance .....	7
<i>Shlomi Linoy (University of New Brunswick), Suprio Ray (University of New Brunswick), and Natalia Stakhanova (University of Saskatchewan)</i>	
Blockchain Enabled Distributed Storage and Sharing of Personal Data Assets .....	11
<i>Jānis Grabis (Riga Technical University), Vlado Stankovski (University of Ljubljana), and Roberts Zariņš (Riga Technical University)</i>	
Legal Smart Contracts in Ethereum Block Chain: Linking the Dots .....	18
<i>Eleanna Kafeza (Zayed University, Dubai), Syed Juned Ali (International Institute of Information Technology, Hyderabad), Irene Kafeza (Kafeza Law Office), and Haseena AlKatheeri (Zayed University, Dubai)</i>	

## International Workshop on Data-Driven Smart Cities (DASC 2020)

HiDaM: A Unified Data Model for High-Definition (HD) Map Data .....	26
<i>Yunfan Kang (University of California, Riverside) and Amr Magdy (University of California, Riverside)</i>	
Pulse of the City: Spatio-Temporal Twitter Content Analysis .....	33
<i>Yunan Lu (Columbia University in the City of New York), William Kusmik (Columbia University in the City of New York), and Deepak Turaga (Oden Technologies)</i>	

Fuel Consumption Analysis of Driven Trips with Respect to Route Choice .....	40
<i>Ekaterina Gilman (Center for Ubiquitous Computing, University of Oulu, Finland), Satu Tamminen (Biomimetics and Intelligent Systems Group, University of Oulu, Finland), Anja Keskinarkaus (Center for Machine Vision and Signal Analysis, University of Oulu, Finland), Theodoros Anagnostopoulos (ITMO University, Saint Petersburg, Russia; University of West Attica, Athens, Greece), Xiang Su (University of Helsinki, Finland; Center for Ubiquitous Computing, University of Oulu, Finland), Susanna Pirttikangas (Center for Ubiquitous Computing, University of Oulu, Finland), and Jukka Riekkki (Center for Ubiquitous Computing, University of Oulu, Finland)</i>	
Public and Open Internet of Things for Smart Cities: The SME Perspective .....	48
<i>Pekka Okkonen (University of Oulu), Jarkko Hyysalo (University of Oulu), and Ella Peltonen (University of Oulu)</i>	
Proactive User Engagement via Friendly Survey and Data-Driven Methodologies .....	56
<i>Paolo Bethaz (Politecnico di Torino), Riccardo Callà (Politecnico di Torino), Tania Cerquitelli (Politecnico di Torino), Arianna Montorsi (Politecnico di Torino), and Claudia De Giorgi (Politecnico di Torino)</i>	
Think Cities: The Accelerator for Sustainable Planning .....	64
<i>Gwenaelle Carfantan (SETUR), Florian Daniel (SenX), Laurent d'Orazio (Univ Rennes, CNRS, IRISA), Trung-Dung Le (Univ Rennes, CNRS, IRISA), Xavier Marin (SenX), Olivier Peau (SETUR), and Hervé Rannou (SenX)</i>	
Optimal Seeds Discovery of Traffic Congestions .....	71
<i>Carlos Bermejo (Hong Kong University of Science and Technology), Ting Wu (Hong Kong University of Science and Technology), Xiang Su (University of Helsinki), and Pan Hui (Hong Kong University of Science and Technology)</i>	

### **3rd International Workshop on Data Engineering meets Intelligent Food & Cooking Recipes (2020 DECOR2020@ICDE)**

Design Research in Food Science: Keynote Introduction .....	79
<i>Alan R. Hevner (Design Research in Food Science: Keynote Introduction)</i>	
Nutritional Profile Estimation in Cooking Recipes .....	82
<i>Jushaan Kalra (IIIT-Delhi), Devansh Batra (NSUT), Nirav Diwan (IIIT-Delhi), and Ganesh Bagler (IIIT-Delhi)</i>	
A Named Entity Based Approach to Model Recipes .....	88
<i>Nirav Diwan (IIIT-Delhi), Devansh Batra (NSUT), and Ganesh Bagler (IIIT-Delhi)</i>	
Food Recipe Alternation and Generation with Natural Language Processing Techniques .....	94
<i>Yuran Pan (Fordham University), Qiangwen Xu (Fordham University), and Yanjun Li (Fordham University)</i>	
Hierarchical Clustering of World Cuisines .....	98
<i>Tript Sharma (DTU), Utkarsh Upadhyay (JMI), Jushaan Kalra (DTU), Sakshi Arora (IIIT-Delhi), Saad Ahmad (IIIT-Delhi), Bhavay Aggarwal (IIIT-Delhi), and Ganesh Bagler (IIIT-Delhi)</i>	

Classification of Cuisines from Sequentially Structured Recipes .....	105
<i>Tript Sharma (DTU), Utkarsh Upadhyay (JMI), and Ganesh Bagler (IIIT-Delhi)</i>	

## **Joint International Workshop on Big Data Management on Emerging Hardware and Data Management on Virtualized Active Systems ( HardBD & Active 2020)**

On the Necessity of Explicit Cross-Layer Data Formats in Near-Data Processing Systems .....	109
<i>Tobias Vinçon (Data Management Lab, Reutlingen University, Germany), Arthur Bernhardt (Data Management Lab, Reutlingen University, Germany), Lukas Weber (Embedded Systems and their Applications Group, TU Darmstadt, Germany), Andreas Koch (Embedded Systems and their Applications Group, TU Darmstadt, Germany), and Iliá Petrov (Data Management Lab, Reutlingen University, Germany)</i>	
Selective Caching: A Persistent Memory Approach for Multi-dimensional Index Structures .....	115
<i>Muhammad Attahir Jibril (TU Ilmenau), Philipp Götze (TU Ilmenau), David Broneske (OvG University Magdeburg), and Kai-Uwe Sattler (TU Ilmenau)</i>	
A Persistent Memory-Aware Buffer Pool Manager Simulator for Multi-tenant Cloud Databases .....	121
<i>Taras Basiuk (University of Oklahoma), Le Gruenwald (University of Oklahoma), Laurent d'Orazio (Rennes 1 University), and Eleazar Leal (University of Minnesota Duluth)</i>	

## **Eleventh International Workshop on Self-Managing Database Systems (SMDB 2020)**

Adaptive Distributed Partitioning in Apache Flink .....	127
<i>Theodoros Toliopoulos (Aristotle University of Thessaloniki) and Anastasios Gounaris (Aristotle University of Thessaloniki)</i>	
Towards Self-Adapting Data Migration in the Context of Schema Evolution in NoSQL Databases....	133
<i>Andrea Hillenbrand (Darmstadt University of Applied Sciences), Uta Störl (Darmstadt University of Applied Sciences), Maksym Levchenko (Darmstadt University of Applied Sciences), Shamil Nabiyev (Darmstadt University of Applied Sciences), and Meike Klettke (University of Rostock)</i>	
PatchIndex - Exploiting Approximate Constraints in Self-Managing Databases .....	139
<i>Steffen Kläbe (TU Ilmenau), Kai-Uwe Sattler (TU Ilmenau), and Stephan Baumann (Actian Germany GmbH)</i>	
START – Self-Tuning Adaptive Radix Tree .....	147
<i>Philipp Fent (Technische Universität München), Michael Jungmair (Technische Universität München), Andreas Kipf (Technische Universität München), and Thomas Neumann (Technische Universität München)</i>	

Cost-Guided Cardinality Estimation: Focus Where it Matters .....	154
<i>Parimarjan Negi (Massachusetts Institute of Technology), Ryan Marcus (Massachusetts Institute of Technology), Hongzi Mao (Massachusetts Institute of Technology), Nesime Tatbul (Massachusetts Institute of Technology), Tim Kraska (Massachusetts Institute of Technology), and Mohammad Alizadeh (Massachusetts Institute of Technology)</i>	
Online Index Selection Using Deep Reinforcement Learning for a Cluster Database .....	158
<i>Zahra Sadri (University of Oklahoma), Le Gruenwald (University of Oklahoma), and Eleazar Leal (University of Minnesota Duluth)</i>	
<b>Author Index .....</b>	<b>163</b>