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Tzung-Pei Hong · Krystian Wojtkiewicz ·
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Recent Challenges in Intelligent Information and Database Systems

13th Asian Conference, ACIIDS 2021
Phuket, Thailand, April 7–10, 2021
Proceedings

Springer

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Preface

ACIIDS 2021 was the 13th edition of the Asian Conference on Intelligent Information and Database Systems. The aim of ACIIDS 2021 was to provide an international forum for research workers with scientific backgrounds on the technology of intelligent information and database systems and its various applications. The ACIIDS 2021 conference was co-organized by King Mongkut's Institute of Technology Ladkrabang (Thailand) and Wrocław University of Science and Technology (Poland) in cooperation with the IEEE SMC Technical Committee on Computational Collective Intelligence, the European Research Center for Information Systems (ERCIS), The University of Newcastle (Australia), Yeungnam University (South Korea), Leiden University (The Netherlands), Universiti Teknologi Malaysia (Malaysia), BINUS University (Indonesia), Quang Binh University (Vietnam), Nguyen Tat Thanh University (Vietnam), and the "Collective Intelligence" section of the Committee on Informatics of the Polish Academy of Sciences. ACIIDS 2021 was at first scheduled to be held in Phuket, Thailand during April 7–10, 2021. However, due to the COVID-19 pandemic, the conference was moved to the virtual space and conducted online using the ZOOM videoconferencing system.

The ACIIDS conference series is already well established. The first two events, ACIIDS 2009 and ACIIDS 2010, took place in Dong Hoi City and Hue City in Vietnam, respectively. The third event, ACIIDS 2011, took place in Daegu (South Korea), followed by the fourth event, ACIIDS 2012, in Kaohsiung (Taiwan). The fifth event, ACIIDS 2013, was held in Kuala Lumpur (Malaysia) while the sixth event, ACIIDS 2014, was held in Bangkok (Thailand). The seventh event, ACIIDS 2015, took place in Bali (Indonesia), followed by the eighth event, ACIIDS 2016, in Da Nang (Vietnam). The ninth event, ACIIDS 2017, was organized in Kanazawa (Japan). The 10th jubilee conference, ACIIDS 2018, was held in Dong Hoi City (Vietnam), followed by the 11th event, ACIIDS 2019, in Yogyakarta (Indonesia). The 12th and 13th events were initially planned to be held in Phuket (Thailand). However, the global pandemic relating to COVID-19 resulted in both editions of the conference being held online in virtual space.

This volume contains 35 peer-reviewed papers, selected for poster presentation from 291 submissions in total. Papers included in this volume cover the following topics: data mining and machine learning methods, advanced data mining techniques and applications, intelligent and contextual systems, natural language processing, network systems and applications, computational imaging and vision, decision support and control systems, and data modelling and processing for industry 4.0.

The accepted and presented papers focused on new trends and challenges facing the intelligent information and database systems community. The presenters showed how research work could stimulate novel and innovative applications. We hope that you found these results useful and inspiring for your future research work.

We would like to express our sincere thanks to the honorary chairs for their support: Prof. Suchatvee Suwansawat (President of King Mongkut's Institute of Technology Ladkrabang, Thailand), Prof. Arkadiusz Wójs (Rector of Wrocław University of Science and Technology, Poland), and Prof. Moonis Ali (President of the International Society of Applied Intelligence, USA). We would like to express our thanks to the keynote speakers for their world-class plenary speeches: Dr. Edwin Lughofer from Johannes Kepler University Linz (Austria), Prof. Manuel Núñez from Universidad Complutense de Madrid (Spain), and Prof. Agachai Sumalee from Chulalongkorn University (Thailand).

We cordially thank our main sponsors: King Mongkut's Institute of Technology Ladkrabang (Thailand) and Wrocław University of Science and Technology (Poland), as well as all aforementioned cooperating universities and organizations. Our special thanks are also due to Springer for publishing the proceedings and to all the other sponsors for their kind support.

Our special thanks go to the Program Chairs, Special Session Chairs, Organizing Chairs, Publicity Chairs, Liaison Chairs, and Local Organizing Committee for their work towards the conference. We sincerely thank all the members of the international Program Committee for their valuable efforts in the review process, which helped us to guarantee the highest quality of the selected papers for the conference. We cordially thank all the authors, for their valuable contributions, and the other participants of the conference. The conference would not have been possible without their support. Thanks are also due to the numerous experts who contributed to making the event a success.

April 2021
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Van Vo	Ho Chi Minh University of Industry, Vietnam
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Ju-Chin Chen	National Kaohsiung University of Science and Technology, Taiwan
Tho Le	Ho Chi Minh City University of Technology, Vietnam
Dang Nguyen	Deakin University, Australia

Hau Le	Thuyloi University, Vietnam
Thien-Hoang Van	Ho Chi Minh City University of Technology, Vietnam
Tho Quan	Ho Chi Minh City University of Technology, Vietnam
Ham Nguyen	University of People's Security, Vietnam
Thiet Pham	Ho Chi Minh University of Industry, Vietnam
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Benlian Xu	Changshu Institute of Technology, China
Weifeng Liu	Hangzhou Danzi University, China
Ashish Khare	University of Allahabad, India
Moonsoo Kang	Chosun University, South Korea
Sang Woong Lee	Gachon University, South Korea
Ekkarat Boonchieng	Chiang Mai University, Thailand
Jeong-Seon Park	Chonnam National University, South Korea
Unsang Park	Sogang University, South Korea
R. Z. Khan	Aligarh Muslim University, India
Suman Mitra	DA-IICT, India
Bakul Gohel	DA-IICT, India
Sathya Narayanan	NTU, Singapore
Jaeyong Kang	Korea National University of Transportation, South Korea
Zahid Ullah	Korea National University of Transportation, South Korea

CoSenseAI 2021: Special Session on Commonsense Knowledge, Reasoning and Programming in Artificial Intelligence

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Apivadee Piyatumrong	NECTEC, Thailand
M. Ilhan Akbas	Embry-Riddle Aeronautical University, USA
Christoph Benzmüller	Freie Universität Berlin, Germany

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Rastko Selmic	Concordia University, Canada
Daniel Stolfi	University of Luxembourg, Luxembourg
Juan Luis Jiménez Laredo	Normandy University, France
Kittichai Lavangnananda	King Mongkut's University of Technology Thonburi, Thailand
Boonyarit Changaival	University of Luxembourg, Luxembourg
Marco Rocchetto	ALES, United Technologies Research Center, Italy
Jundong Chen	Dickinson State University, USA
Emmanuel Kieffer	University of Luxembourg, Luxembourg
Fang-Jing Wu	Technical University Dortmund, Germany
Umer Wasim	University of Luxembourg, Luxembourg

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Rafał Cupek	Silesian University of Technology, Poland
Helena Dudycz	Wrocław University of Economics and Business, Poland
Marcin Fojcik	Western Norway University of Applied Sciences, Norway
Du Haizhou	Shanghai University of Electric Power, China
Marcin Hernes	Wrocław University of Economics and Business, Poland
Wojciech Hunek	Opole University of Technology, Poland
Marcin Jodłowiec	Wrocław University of Science and Technology, Poland
Marek Krótkiewicz	Wrocław University of Science and Technology, Poland
Florin Leon	Gheorghe Asachi Technical University of Iasi, Romania
Rafał Palak	Wrocław University of Science and Technology, Poland
Jacek Piskorowski	West Pomeranian University of Technology, Szczecin, Poland
Khouloud Salameh	American University of Ras Al Khaimah, United Arab Emirates
Predrag Stanimirović	University of Niš, Serbia
Krystian Wojtkiewicz	Wrocław University of Science and Technology, Poland
Feifei Xu	Southeast University, China

ICxS 2021: Special Session on Intelligent and Contextual Systems

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Basabi Chakraborty	Iwate Prefectural University, Japan
Chao-Chun Chen	National Cheng Kung University, Taiwan
Dariusz Frejlichowski	West Pomeranian University of Technology, Szczecin, Poland
Erdenebileg Batbaatar	Chungbuk National University, South Korea
Goutam Chakraborty	Iwate Prefectural University, Japan
Ha Manh Tran	Ho Chi Minh City International University, Vietnam
Hong Vu Nguyen	Ton Duc Thang University, Vietnam
Hideyuki Takahashi	Tohoku Gakuin University, Japan
Jerzy Świątek	Wrocław University of Science and Technology, Poland
Józef Korbicz	University of Zielona Gora, Poland
Keun Ho Ryu	Chungbuk National University, South Korea
Khanindra Pathak	Indian Institute of Technology Kharagpur, India
Kilho Shin	Gakashuin University, Japan
Lkhagvadorj Munkhdalai	Chungbuk National University, South Korea
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Marcin Fojcik	Western Norway University of Applied Sciences, Norway
Masafumi Matsuhara	Iwate Prefectural University, Japan
Meijing Li	Shanghai Maritime University, China
Min-Hsiung Hung	Chinese Culture University, Taiwan
Miroslava Mikusova	University of Žilina, Slovakia
Musa Ibrahim	Chungbuk National University, South Korea
Nguyen Khang Pham	Can Tho University, Vietnam
Nipon Theera-Umpon	Chiang Mai University, Thailand
Plamen Angelov	Lancaster University, UK
Qiangfu Zhao	University of Aizu, Japan
Quan Thanh Tho	Ho Chi Minh City University of Technology, Vietnam
Rafal Palak	Wrocław University of Science and Technology, Poland
Rashmi Dutta Baruah	Indian Institute of Technology Guwahati, India
Sansanee Auephanwiriyakul	Chiang Mai University, Thailand
Sonali Chouhan	Indian Institute of Technology Guwahati, India
Takako Hashimoto	Chiba University of Commerce, Japan
Tetsuji Kuboyama	Gakushuin University, Japan
Thai-Nghe Nguyen	Can Tho University, Vietnam

ISCEC 2021: Special Session on Intelligent Supply Chains and e-Commerce

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Carlos Andres Romano	Polytechnic University of Valencia, Spain
Costin Badica	University of Craiova, Romania
Davor Dujak	University of Osijek, Croatia
Miklós Krész	InnoRenew, Slovenia
Paweł Pawlewski	Poznań University of Technology, Poland
Adam Koliński	Łukasiewicz Research Network – The Institute of Logistics and Warehousing, Poland
Marcin Anholcer	Poznań University of Economics and Business, Poland

MMAML 2021: Special Session on Multiple Model Approach to Machine Learning

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Abdelhamid Bouchachia	Bournemouth University, UK
Robert Burduk	Wrocław University of Science and Technology, Poland
Oscar Castillo	Tijuana Institute of Technology, Mexico
Rung-Ching Chen	Chaoyang University of Technology, Taiwan
Suphamit Chittayasothorn	King Mongkut's Institute of Technology Ladkrabang, Thailand
José Alfredo F. Costa	Federal University of Rio Grande do Norte (UFRN), Brazil
Ireneusz Czarnowski	Gdynia Maritime University, Poland
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Tzung-Pei Hong	National University of Kaohsiung, Taiwan
Piotr Jędrzejowicz	Gdynia Maritime University, Poland
Tomasz Kajdanowicz	Wrocław University of Science and Technology, Poland
Yong Seog Kim	Utah State University, USA
Bartosz Krawczyk	Virginia Commonwealth University, USA
Kun Chang Lee	Sungkyunkwan University, South Korea
Edwin Lughofer	Johannes Kepler University Linz, Austria
Hector Quintian	University of Salamanca, Spain
Andrzej Siemiński	Wrocław University of Science and Technology, Poland
Dragan Simic	University of Novi Sad, Serbia

Adam Słowik	Koszalin University of Technology, Poland
Zbigniew Telec	Wrocław University of Science and Technology, Poland
Bogdan Trawiński	Wrocław University of Science and Technology, Poland
Olgierd Unold	Wrocław University of Science and Technology, Poland
Michał Woźniak	Wrocław University of Science and Technology, Poland
Zhongwei Zhang	University of Southern Queensland, Australia
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