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# Intelligent Information and Database Systems

10th Asian Conference, ACIIDS 2018  
Dong Hoi City, Vietnam, March 19–21, 2018  
Proceedings, Part I

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# Preface

ACIIDS 2018 was the tenth event in a series of international scientific conferences on research and applications in the field of intelligent information and database systems. The aim of ACIIDS 2018 was to provide an international forum for scientific research in the technology and application of intelligent information and database systems. ACIIDS 2018 was co-organized by Quang Binh University (Vietnam) and Wrocław University of Science and Technology (Poland) in co-operation with the IEEE SMC Technical Committee on Computational Collective Intelligence, European Research Center for Information Systems (ERCIS), University of Newcastle (Australia), Bina Nusantara University (Indonesia), Yeungnam University (South Korea), Leiden University (The Netherlands), Universiti Teknologi Malaysia (Malaysia), Ton Duc Thang University (Vietnam), and Vietnam National University, Hanoi (Vietnam). It took place in Dong Hoi City in Vietnam during March 19–21, 2018.

The conference series ACIIDS 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 in Malaysia while the sixth event, ACIIDS 2014, was held in Bangkok in Thailand. The seventh event, ACIIDS 2015, took place in Bali (Indonesia), followed by the eight event, ACIIDS 2016, in Da Nang (Vietnam). The last event, ACIIDS 2017, was held in Kanazawa (Japan).

We received more than 400 papers from 42 countries all over the world. Each paper was peer reviewed by at least two members of the international Program Committee and international reviewer board. Only 133 papers with the highest quality were selected for an oral presentation and publication in the two volumes of the ACIIDS 2018 proceedings.

Papers included in the proceedings cover the following topics: knowledge engineering and Semantic Web; social networks and recommender systems; text processing and information retrieval; machine learning and data mining; decision support and control systems; computer vision techniques; advanced data mining techniques and applications; multiple model approach to machine learning; intelligent information systems; design thinking-based R&D; development techniques; and project-based learning; modelling, storing, and querying of graph data; computational imaging and vision; computer vision and robotics; data science and computational intelligence; data structures modelling for knowledge representation; intelligent computer vision systems and applications; intelligent and contextual systems; intelligent biomarkers of neurodegenerative processes in the brain; sensor networks and Internet of Things; intelligent applications of Internet of Thing and data analysis technologies; intelligent systems and algorithms in information sciences; intelligent systems and methods in biomedicine; intelligent systems for optimization of logistics and industrial applications; analysis of image, video, and motion data in life sciences.

The accepted and presented papers highlight new trends and challenges facing the intelligent information and database systems community. The presenters showed how new research could lead to novel and innovative applications. We hope you will find these results useful and inspiring for your future research work.

We would like to extend our heartfelt thanks to Jarosław Gowin, Deputy Prime Minister of the Republic of Poland and Minister of Science and Higher Education, for his support and honorary patronage of the conference.

We would like to express our sincere thanks to the honorary chairs, Prof. Cezary Madryas (Rector of Wrocław University of Science and Technology, Poland), Prof. Huu Duc Nguyen (Vice-Rector of National University Hanoi, Vietnam), and Dr. Tien Dung Tran (Vice-President of Quang Binh Province, Vietnam), for their 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 for 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 the organizers and chairs of special sessions who contributed to the success of the conference.

We would like to express our thanks to the keynote speakers: Thomas Bäck from University of Leiden, The Netherlands, Lipo Wang from Nanyang Technological University, Singapore, Satoshi Tojo from Japan Advanced Institute of Science and Technology, Japan, and Nguyen Huu Duc from Vietnam National University, Hanoi, Vietnam, for their world-class plenary speeches.

We cordially thank our main sponsors, Quang Binh University (Vietnam), Wrocław University of Science and Technology (Poland), IEEE SMC Technical Committee on Computational Collective Intelligence, European Research Center for Information Systems (ERCIS), University of Newcastle (Australia), Bina Nusantara University (Indonesia), Yeungnam University (South Korea), Leiden University (The Netherlands), Universiti Teknologi Malaysia (Malaysia), Ton Duc Thang University (Vietnam), and Vietnam National University, Hanoi (Vietnam). Our special thanks are due also to Springer for publishing the proceedings and sponsoring awards, and to all the other sponsors for their kind support.

We wish to thank the members of the Organizing Committee for their excellent work and the members of the local Organizing Committee for their considerable effort.

We cordially thank all the authors, for their valuable contributions, and the other participants of this conference. The conference would not have been possible without their support.

Thanks are also due to many experts who contributed to making the event a success.

March 2018

Ngoc Thanh Nguyen  
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(ADMTA 2018)**

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# Contents – Part I

## Knowledge Engineering and Semantic Web

Solving Inconsistencies in Probabilistic Knowledge Bases via Inconsistency Measures . . . . .	3
<i>Van Tham Nguyen and Trong Hieu Tran</i>	
The Assessing of Influence of Collective Intelligence on the Final Consensus Quality. . . . .	15
<i>Adrianna Kozierkiewicz, Van Du Nguyen, and Marcin Pietranik</i>	
Design Pattern Ranking Based on the Design Pattern Intent Ontology . . . . .	25
<i>Channa Bou, Nasith Laosen, and Ekawit Nantajeewarawat</i>	
Solving Query-Answering Problems with Constraints for Function Variables . . . . .	36
<i>Kiyoshi Akama and Ekawit Nantajeewarawat</i>	
Heuristic Algorithms for 2-Optimality Consensus Determination . . . . .	48
<i>Adrianna Kozierkiewicz and Mateusz Sitarczyk</i>	
A Memory-Efficient Algorithm with Level-Order Unary Degree Sequence for Forward Reasoning Engines . . . . .	59
<i>Hiromu Hiidome, Yuichi Goto, and Jingde Cheng</i>	
Methodical Aspects of Knowledge Management in a Contemporary Company . . . . .	71
<i>Maciej Malara and Zbigniew Malara</i>	

## Social Networks and Recommender Systems

Fairness in Culturally Dependent Waiting Behavior: Cultural Influences on Social Communication in Simulated Crowds . . . . .	85
<i>Sutasinee Thovuttikul, Yoshimasa Ohmoto, and Toyoaki Nishida</i>	
Differential Information Diffusion Model in Social Network. . . . .	96
<i>Hong T. Tu and Khu P. Nguyen</i>	
Targeted Misinformation Blocking on Online Social Networks . . . . .	107
<i>Canh V. Pham, Quat V. Phu, and Huan X. Hoang</i>	
Conversation Strategy of a Chatbot for Interactive Recommendations . . . . .	117
<i>Yuichiro Ikemoto, Varit Asawavetvutt, Kazuhiro Kuwabara, and Hung-Hsuan Huang</i>	

Competitive Information Diffusion Model in Social Network with Negative Information Propagation. . . . .	127
<i>Hong T. Tu and Khu P. Nguyen</i>	

Using Differential Evolution with a Simple Hybrid Feature for Personalized Recommendation. . . . .	137
<i>Michał Balchanowski, Urszula Boryczka, and Kamil Dworak</i>	

## Text Processing and Information Retrieval

Aspect-Based Sentiment Analysis of Vietnamese Texts with Deep Learning. . . . .	149
<i>Long Mai and Bac Le</i>	

Practice of Word Sense Disambiguation. . . . .	159
<i>Andrzej Siemiński</i>	

Most Frequent Errors in Digitization of Polish Ancient Manuscripts . . . . .	170
<i>Kazimierz Choroś and Joanna Jarosz</i>	

Using the Reddit Corpus for Cyberbully Detection . . . . .	180
<i>Tazeek Bin Abdur Rakib and Lay-Ki Soon</i>	

A Positive-Unlabeled Learning Model for Extending a Vietnamese Petroleum Dictionary Based on Vietnamese Wikipedia Data. . . . .	190
<i>Ngoc-Trinh Vu, Quoc-Dat Nguyen, Tien-Dat Nguyen, Manh-Cuong Nguyen, Van-Vuong Vu, and Quang-Thuy Ha</i>	

A New Lifelong Topic Modeling Method and Its Application to Vietnamese Text Multi-label Classification . . . . .	200
<i>Quang-Thuy Ha, Thi-Ngan Pham, Van-Quang Nguyen, Thi-Cham Nguyen, Thi-Hong Vuong, Minh-Tuoi Tran, and Tri-Thanh Nguyen</i>	

An English-Vietnamese Translation System Using Artificial Intelligence Approach . . . . .	211
<i>Nguyen Van Binh and Huynh Cong Phap</i>	

## Machine Learning and Data Mining

Classification of Bird Sounds Using Codebook Features . . . . .	223
<i>Alfonso B. Labao, Mark A. Clutario, and Prospero C. Naval Jr.</i>	

A Degenerate Agglomerative Hierarchical Clustering Algorithm for Community Detection. . . . .	234
<i>Antonio Maria Fiscarelli, Aleksandr Beliakov, Stanislav Konchenko, and Pascal Bouvry</i>	

Multiple Function Approximation - A New Approach Using Complex Fuzzy Inference System . . . . .	243
<i>Chia-Hao Tu and Chunshien Li</i>	
Decision Tree Using Local Support Vector Regression for Large Datasets . . .	255
<i>Minh-Thu Tran-Nguyen, Le-Diem Bui, Yong-Gi Kim, and Thanh-Nghi Do</i>	
LR-SDiscr: An Efficient Algorithm for Supervised Discretization . . . . .	266
<i>Habiba Drias, Hadjer Moulai, and Nourelhouda Rehkab</i>	
Path Histogram Distance for Rooted Labeled Caterpillars . . . . .	276
<i>Taiga Kawaguchi, Takuya Yoshino, and Kouichi Hirata</i>	
Deep 3D Convolutional Neural Network Architectures for Alzheimer's Disease Diagnosis . . . . .	287
<i>Hiroki Karasawa, Chien-Liang Liu, and Hayato Ohwada</i>	
Kernel and Acquisition Function Setup for Bayesian Optimization of Gradient Boosting Hyperparameters. . . . .	297
<i>Andrzej Szwabe</i>	
Low-Feature Extraction for Multi-label Patterns Analyzing in Complex Time Series Mining. . . . .	307
<i>Ngoc Anh Thi Nguyen, Trung Hung Vo, Sun-Hee Kim, Tran Quoc Vinh Nguyen, A-Ran Oh, and Hyung-Jeong Yang</i>	
Analysis on Hybrid Dominance-Based Rough Set Parameterization Using Private Financial Initiative Unitary Charges Data . . . . .	318
<i>Masurah Mohamad and Ali Selamat</i>	
<b>Decision Support and Control Systems</b>	
Smart Lighting Control Architecture and Benefits . . . . .	331
<i>Igor Wojnicki and Sebastian Ernst</i>	
The Adaptation of the Harmony Search Algorithm to the ATSP . . . . .	341
<i>Urszula Boryczka and Krzysztof Szwarc</i>	
Algorithms for Solving the Vehicle Routing Problem with Drones . . . . .	352
<i>Daniel Schermer, Mahdi Moeini, and Oliver Wendt</i>	
A Local Search Heuristic for Solving the Maximum Dispersion Problem . . .	362
<i>Mahdi Moeini, David Goerzen, and Oliver Wendt</i>	

Using a Multi-agent System for Overcoming Flickering Effect in Distributed Large-Scale Customized Lighting Design. . . . .	372
<i>Adam Sędziwy and Leszek Kotulski</i>	
The Optimal Control Problem with Fixed-End Trajectories for a Three-Sector Economic Model of a Cluster. . . . .	382
<i>Zainelkhriet Murzabekov, Marek Miłosz, and Kamshat Tussupova</i>	
Knowledge Representation of Cognitive Agents Processing the Economy Events . . . . .	392
<i>Marcin Hernes and Andrzej Bytniewski</i>	
Collinearity Models in the Eigenvalue Problem. . . . .	402
<i>Leon Bobrowski</i>	
The Shapley Value in Fuzzy Simple Cooperative Games . . . . .	410
<i>Barbara Gładysz and Jacek Mercik</i>	
A Constraint-Based Framework for Scheduling Problems. . . . .	419
<i>Jarosław Wikarek, Paweł Sitek, and Tadeusz Stefański</i>	
<b>Computer Vision Techniques</b>	
A Reliable Image-to-Video Person Re-identification Based on Feature Fusion . . . . .	433
<i>Thuy-Binh Nguyen, Thi-Lan Le, Dinh-Duc Nguyen, and Dinh-Tan Pham</i>	
Video Classification Technology in a Knowledge-Vision-Integration Platform for Personal Protective Equipment Detection: An Evaluation . . . . .	443
<i>Caterine Silva de Oliveira, Cesar Sanin, and Edward Szczerbicki</i>	
Feature-Based Image Compression . . . . .	454
<i>Pavel Morozkin, Marc Swynghedauw, and Maria Trocan</i>	
Scoring Photographic Rule of Thirds in a Large MIRFLICKR Dataset: A Showdown Between Machine Perception and Human Perception of Image Aesthetics. . . . .	466
<i>Adnan Firoze, Tousif Osman, Shahreen Shahjahan Psyche, and Rashedur M. Rahman</i>	
Towards Robust Evaluation of Super-Resolution Satellite Image Reconstruction . . . . .	476
<i>Michał Kawulok, Paweł Benecki, Jakub Nalepa, Daniel Kostrzewa, and Łukasz Skonieczny</i>	

## Advanced Data Mining Techniques and Applications

An Automated Deployment Scheme with Script-Based Development for Cloud Manufacturing Platforms . . . . .	489
<i>Jhang-Jhan Huang, Chao-Chun Chen, Zhong-Hui Lin, Mao-Yuan Pai, and Gen-Ming Guo</i>	
A Parking Occupancy Prediction Approach Based on Spatial and Temporal Analysis . . . . .	500
<i>Eric Hsueh-Chan Lu and Chen-Hao Liao</i>	
An Approach for Diverse Group Stock Portfolio Optimization Using the Fuzzy Grouping Genetic Algorithm . . . . .	510
<i>Chun-Hao Chen, Bing-Yang Chiang, Tzung-Pei Hong, Ding-Chau Wang, and Jerry Chun-Wei Lin</i>	
A Novel Approach for Option Trading Based on Kelly Criterion . . . . .	519
<i>Mu-En Wu and Wei-Ho Chung</i>	
Music Recommendation Based on Information of User Profiles, Music Genres and User Ratings . . . . .	528
<i>Ja-Hwung Su, Chu-Yu Chin, Hsiao-Chuan Yang, Vincent S. Tseng, and Sun-Yuan Hsieh</i>	
W-PathSim: Novel Approach of Weighted Similarity Measure in Content-Based Heterogeneous Information Networks by Applying LDA Topic Modeling . . . . .	539
<i>Phu Pham, Phuc Do, and Chien D. C. Ta</i>	
Representative Rule Templates for Association Rules Satisfying Multiple Canonical Evaluation Criteria. . . . .	550
<i>Marzena Kryszkiewicz</i>	

## Multiple Model Approach to Machine Learning

Depth Learning with Convolutional Neural Network for Leaves Classifier Based on Shape of Leaf Vein . . . . .	565
<i>Tan Kiet Nguyen Thanh, Quoc Bao Truong, Quoc Dinh Truong, and Hiep Huynh Xuan</i>	
An Ensemble System with Random Projection and Dynamic Ensemble Selection . . . . .	576
<i>Manh Truong Dang, Anh Vu Luong, Tuyet-Trinh Vu, Quoc Viet Hung Nguyen, Tien Thanh Nguyen, and Bela Stantic</i>	
A Weighted Object-Cluster Association-Based Ensemble Method for Clustering Undergraduate Students . . . . .	587
<i>Chau Thi Ngoc Vo and Phung Hua Nguyen</i>	



Automatic Image Region Annotation by Genetic Algorithm-Based Joint Classifier and Feature Selection in Ensemble System . . . . .	599
<i>Anh Vu Luong, Tien Thanh Nguyen, Xuan Cuong Pham, Thi Thu Thuy Nguyen, Alan Wee-Chung Liew, and Bela Stantic</i>	
Implementing AI for Non-player Characters in 3D Video Games . . . . .	610
<i>Marek Kopel and Tomasz Hajas</i>	
<b>Sensor Networks and Internet of Things</b>	
Comparison of Indoor Positioning System Using Wi-Fi and UWB . . . . .	623
<i>Jaemin Hong, KyuJin Kim, and ChongGun Kim</i>	
A New Approach to Estimate Urban Air Temperature Using Smartphones . . .	633
<i>Nguyen Hai Chau</i>	
Voice Recognition Software on Embedded Devices . . . . .	642
<i>Pavel Vojtas, Jan Stepan, David Sec, Richard Cimler, and Ondrej Krejcar</i>	
<b>Intelligent Information Systems</b>	
Design and Development of an Online Support System for Elder Care . . . . .	653
<i>Sukontip Wongpun and Sumanta Guha</i>	
Is Higher Order Mutant Harder to Kill Than First Order Mutant? An Experimental Study . . . . .	664
<i>Quang-Vu Nguyen and Duong-Thu-Hang Pham</i>	
Information Systems Development via Model Transformations . . . . .	674
<i>Jaroslav Pokorný, Karel Richta, and Tomáš Richta</i>	
A Simply Way for Chronic Disease Prediction and Detection Result Visualization. . . . .	684
<i>Dingkun Li, Hyun Woo Park, Erdenebileg Batbaatar, and Keun Ho Ryu</i>	
An Improved and Tool-Supported Fuzzy Automata Framework to Analyze Heart Data . . . . .	694
<i>Iván Calvo, Mercedes G. Merayo, and Manuel Núñez</i>	
Usability Testing of a Responsive Web System for a School for Disabled Children . . . . .	705
<i>Justyna Krzewska, Agnieszka Indyka-Piasecka, Marek Kopel, Elżbieta Kukla, Zbigniew Telec, and Bogdan Trawiński</i>	
<b>Author Index</b> . . . . .	717

## Contents – Part II

### Data Structures Modelling for Knowledge Representation

Deep Learning Based Approach for Entity Resolution in Databases. . . . .	3
<i>Nihel Kooli, Robin Allesiardo, and Erwan Pigneul</i>	
Generating Arbitrary Cross Table Layout in SuperSQL . . . . .	13
<i>Atsutomo Tabata, Kento Goto, and Motomichi Toyama</i>	
Towards Association-Oriented Model of Lexical Base for Semantic Knowledge Base . . . . .	25
<i>Krystian Wojtkiewicz, Marcin Jodłowiec, and Waldemar Pokuta</i>	
Integration of Relational and NoSQL Databases . . . . .	35
<i>Jaroslav Pokorný</i>	
Complex Relationships Modeling in Association-Oriented Database Metamodel . . . . .	46
<i>Marcin Jodłowiec</i>	
AODB and CDMM Modeling – Comparative Case-Study . . . . .	57
<i>Marek Krótkiewicz and Piotr Zabawa</i>	

### Modelling, Storing, and Querying of Graph Data

Experimental Clarification of Some Issues in Subgraph Isomorphism Algorithms . . . . .	71
<i>Xuguang Ren, Junhu Wang, Nigel Franciscus, and Bela Stantic</i>	
Beyond Word-Cloud: A Graph Model Derived from Beliefs. . . . .	81
<i>Nigel Franciscus, Xuguang Ren, and Bela Stantic</i>	
Meta-Modeling: Decomposition of Responsibilities . . . . .	91
<i>Piotr Zabawa</i>	
Stochastic Pretopology as a Tool for Topological Analysis of Complex Systems . . . . .	102
<i>Quang Vu Bui, Soufian Ben Amor, and Marc Bui</i>	

## Data Science and Computational Intelligence

A Survey of Spatio-Temporal Database Research . . . . .	115
<i>Neelabh Pant, Mohammadhani Fouladgar, Ramez Elmasri, and Kulsawasd Jitkajornwanich</i>	
Automatically Mapping Wikipedia Infobox Attributes to DBpedia Properties for Fast Deployment of Vietnamese DBpedia Chapter. . . . .	127
<i>Nhu Nguyen, Dung Cao, and Anh Nguyen</i>	
A Fast Algorithm for Posterior Inference with Latent Dirichlet Allocation . . .	137
<i>Bui Thi-Thanh-Xuan, Vu Van-Tu, Atsuhiko Takasu, and Khoat Than</i>	

## Design Thinking Based R&D, Development Technique, and Project Based Learning

A Development of Participatory Sensing System for Foreign Visitors in PBL. . . . .	149
<i>Shuta Nakamae, Wataru Sakamoto, Tetsuya Negishi, Shuhei Goto, Buntarou Shizuki, Chiemi Watanabe, and Toshiyuki Amagasa</i>	
A Practice for Training IT Engineers by Combining Two Different Types of PBL. . . . .	159
<i>Kazuhiko Sato, Yosuke Kobayashi, Takeshi Shibata, Hidetsugu Suto, Shinya Watanabe, Shun Hattori, and Sato Saga</i>	
Utilizing Tablets in an Ideathon for University Undergraduates. . . . .	169
<i>Keiichi Endo, Takuya Fujihashi, and Shinya Kobayashi</i>	

## Intelligent and Contextual Systems

An Approach to Representing Traffic State on Urban Roads Used by Various Types of Vehicles . . . . .	179
<i>Tha Thi Bui, Trung Vinh Tran, Linh Hong Thi Le, Ha Hong Thi Duong, and Phuoc Vinh Tran</i>	
Agent-Based Model of Ancient Siege Tactics . . . . .	189
<i>Ondrej Dolezal, Petr Kadrda, and Richard Cimler</i>	
Weights Ordering During Training of Contextual Neural Networks with Generalized Error Backpropagation: Importance and Selection of Sorting Algorithms . . . . .	200
<i>Maciej Huk</i>	
Implementing Contextual Neural Networks in Distributed Machine Learning Framework . . . . .	212
<i>Bartosz Jerzy Janusz and Krzysztof Wołk</i>	

DeepEnergy: Prediction of Appliances Energy with Long-Short Term Memory Recurrent Neural Network . . . . .	224
<i>Erdenebileg Batbaatar, Hyun Woo Park, Dingkun Li, Meijing Li, and Keun Ho Ryu</i>	

Efficient Ensemble Methods for Classification on Clear Cell Renal Cell Carcinoma Clinical Dataset . . . . .	235
<i>Kwang Ho Park, Musa Ibrahim M. Ishag, Kwang Sun Ryu, Meijing Li, and Keun Ho Ryu</i>	

### **Intelligent Systems and Algorithms in Information Sciences**

Solution of Dual Fuzzy Equations Using a New Iterative Method . . . . .	245
<i>Sina Razvarz, Raheleh Jafari, Ole-Christoffer Granmo, and Alexander Gegov</i>	

Transformation of Extended Entity Relationship Model into Ontology . . . . .	256
<i>Zdenka Telnarova</i>	

Pathfinding in a Dynamically Changing Environment . . . . .	265
<i>Eva Volna and Martin Kotyrba</i>	

Ontology Languages for Semantic Web from a Bit Higher Level of Generality . . . . .	275
<i>Martin Žáček, Alena Lukasová, and Marek Vajgl</i>	

### **Intelligent Applications of Internet of Thing and Data Analysis Technologies**

A New Method for Establishing and Managing Group Key Against Network Attacks . . . . .	287
<i>Dao Truong Nguyen and My Tu Le</i>	

Detection of the Bee Queen Presence Using Sound Analysis . . . . .	297
<i>Tymoteusz Cejrowski, Julian Szymański, Higinio Mora, and David Gil</i>	

A Design for an Anti-static Wrist Strap Wireless Monitoring System in a Smart Factory . . . . .	307
<i>Chia-Chi Chang, Shien-Yi Chen, Ching-Chuan Wei, and Yung-Hung Hsu</i>	

Enhanced Passcode Recognition Based on Press Force and Time Interval . . .	315
<i>Hua-Yuan Shih, Song Guo, Rung-Ching Chen, and Chen-Yeng Peng</i>	

A Low-Costed Positioning System Based on Wearable Devices for Elders and Children in a Local Area . . . . .	324
<i>Chuan-Bi Lin, Yung-Fa Huang, Long-Xin Chen, Yu-Chiang Chang, Z-Ming Hong, and Jong-Shin Chen</i>	

**Intelligent Systems and Methods in Biomedicine**

PCA-KNN for Detection of NS1 from SERS Salivary Spectra . . . . .	335
<i>N. H. Othman, Khuan Y. Lee, A. R. M. Radzol, W. Mansor, P. S. Wong, and I. Looi</i>	
Dynamic Modeling of the Czech Republic Population with a Focus on Alzheimer's Disease Patients . . . . .	347
<i>Hana Tomaskova, Petra Maresova, Daniel Jun, Martin Augustynek, Jan Honegr, and Blanka Klimova</i>	
Detection and Dynamical Tracking of Temperature Facial Distribution Caused by Alcohol Intoxication with Using of Modified OTSU Regional Segmentation . . . . .	357
<i>Jan Kubicek, Marek Penhaker, Martin Augustynek, Martin Cerny, David Oczka, and Petra Maresova</i>	
Modelling and Objectification of Secondary X ray Irradiation on Skiagraphy Images in Clinical Conditions . . . . .	367
<i>Jan Kubicek, Martin Augustynek, Andrea Vodakova, and Marek Penhaker</i>	
Framework for Effective Image Processing to Enhance Tuberculosis Diagnosis . . . . .	376
<i>Tsion Samuel, Dawit Assefa, and Ondrej Krejcar</i>	
Multiregional Soft Segmentation Driven by Modified ABC Algorithm and Completed by Spatial Aggregation: Volumetric, Spatial Modelling and Features Extraction of Articular Cartilage Early Loss. . . . .	385
<i>Jan Kubicek, Marek Penhaker, Martin Augustynek, Martin Cerny, and David Oczka</i>	
Pseudo-Relevance Feedback for Information Retrieval in Medicine Using Genetic Algorithms . . . . .	395
<i>Lanh Nguyen and Tru Cao</i>	
Analysis and Modelling of Heel Bone Fracture with Using of Active Contour Driven by Gaussian Energy and Features Extraction . . . . .	405
<i>Jan Kubicek, Marek Penhaker, David Oczka, Martin Augustynek, Martin Cerny, and Petra Maresova</i>	

**Intelligent Biomarkers of Neurodegenerative Processes in Brain**

Automatic Detection and Classification of Brain Hemorrhages . . . . .	417
<i>Anh-Cang Phan, Van-Quyen Vo, and Thuong-Cang Phan</i>	

Rough Set Data Mining Algorithms and Pursuit Eye Movement Measurements Help to Predict Symptom Development in Parkinson's Disease. . . . .	428
<i>Albert Śledzianowski, Artur Szymański, Stanisław Szlufik, and Dariusz Koziorowski</i>	

Rules Determine Therapy-Dependent Relationship in Symptoms Development of Parkinson's Disease Patients . . . . .	436
<i>Andrzej W. Przybyszewski, Stanisław Szlufik, Piotr Habela, and Dariusz M. Koziorowski</i>	

### **Analysis of Image, Video and Motion Data in Life Sciences**

Vertebra Fracture Classification from 3D CT Lumbar Spine Segmentation Masks Using a Convolutional Neural Network . . . . .	449
<i>Charmae B. Antonio, Louise Gillian C. Bautista, Alfonso B. Labao, and Prospero C. Naval Jr.</i>	

Evaluation of Similarity Measuring Method of Human Body Movement Based on 3D Chain Code. . . . .	459
<i>Truong Hong Ngan Pham, Teruhisa Hochin, and Hiroki Nomiya</i>	

Analysis of Convolutional Neural Networks and Shape Features for Detection and Identification of Malaria Parasites on Thin Blood Smears . . . .	472
<i>Kristofer Delas Peñas, Pilarita T. Rivera, and Prospero C. Naval Jr.</i>	

Optical Flow for Collision Avoidance in Autonomous Cars . . . . .	482
<i>Damian Pęszor, Marcin Paszkuta, Marzena Wojciechowska, and Konrad Wojciechowski</i>	

Intelligent Video Monitoring System with the Functionality of Online Recognition of People's Behavior and Interactions Between People. . . . .	492
<i>Marek Kulbacki, Jakub Segen, Sławomir Wojciechowski, Kamil Wereszczyński, Jerzy Paweł Nowacki, Aldona Drabik, and Konrad Wojciechowski</i>	

### **Computational Imaging and Vision**

Satellite Image Classification Based Spatial-Spectral Fuzzy Clustering Algorithm. . . . .	505
<i>Sinh Dinh Mai, Long Thanh Ngo, and Hung Le Trinh</i>	

Classification of Food Images through Interactive Image Segmentation . . . . .	519
<i>Sanasam Inunganbi, Ayan Seal, and Pritee Khanna</i>	

A Multiresolution Approach for Content-Based Image Retrieval Using Wavelet Transform of Local Binary Pattern. . . . .	529
<i>Manish Khare, Prashant Srivastava, Jeonghwan Gwak, and Ashish Khare</i>	

Large-Scale Face Image Retrieval System at Attribute Level Based on Facial Attribute Ontology and Deep Neuron Network . . . . .	539
<i>Hung M. Nguyen, Ngoc Q. Ly, and Trang T. T. Phung</i>	

**Computer Vision and Robotics**

Speed-Up 3D Human Pose Estimation Task Using Sub-spacing Approach . . .	553
<i>Van-Thanh Hoang and Kang-Hyun Jo</i>	

Pedestrian Action Prediction Based on Deep Features Extraction of Human Posture and Traffic Scene. . . . .	563
<i>Diem-Phuc Tran, Nguyen Gia Nhu, and Van-Dung Hoang</i>	

Deep CNN and Data Augmentation for Skin Lesion Classification . . . . .	573
<i>Tri-Cong Pham, Chi-Mai Luong, Muriel Visani, and Van-Dung Hoang</i>	

Stationary Object Detection for Vision-Based Smart Monitoring System . . . .	583
<i>Wahyono, Reza Pulungan, and Kang-Hyun Jo</i>	

CNN-Based Character Recognition for License Plate Recognition System . . .	594
<i>Van Huy Pham, Phong Quang Dinh, and Van Huan Nguyen</i>	

Improving Traffic Signs Recognition Based Region Proposal and Deep Neural Networks. . . . .	604
<i>Van-Dung Hoang, My-Ha Le, Truc Thanh Tran, and Van-Huy Pham</i>	

**Intelligent Computer Vision Systems and Applications**

A New Algorithm for Greyscale Objects Representation by Means of the Polar Transform and Vertical and Horizontal Projections . . . . .	617
<i>Dariusz Frejlichowski</i>	

A New Framework for People Counting from Coarse to Fine Could be Robust to Viewpoint and Illumination. . . . .	626
<i>An H. Nguyen and Ngoc Q. Ly</i>	

Automatic Measurement of Concrete Crack Width in 2D Multiple-phase Images for Building Safety Evaluation. . . . .	638
<i>Hoang Nam Nguyen, Tan Y Nguyen, and Duc Lam Pham</i>	

## **Intelligent Systems for Optimization of Logistics and Industrial Applications**

Community of Practice for Product Innovation Towards the Establishment of Industry 4.0 . . . . .	651
<i>Mohammad Maqbool Waris, Cesar Sanin, and Edward Szczerbicki</i>	
Improving KPI Based Performance Analysis in Discrete, Multi-variant Production . . . . .	661
<i>Rafał Cupek, Adam Ziębiński, Marek Drewniak, and Marcin Fojcik</i>	
Estimation of the Number of Energy Consumption Profiles in the Case of Discreet Multi-variant Production . . . . .	674
<i>Rafał Cupek, Adam Ziębiński, Marek Drewniak, and Marcin Fojcik</i>	
Online Monitoring System of the Enrichment Factory Input Ore Flows Quality on the Base of Temporal Model . . . . .	685
<i>Viktor Toporov, Valery Axelrod, and Ualsher Tukeyev</i>	
Modeling of Position Control for Hydraulic Cylinder Using Servo Valve . . . .	696
<i>Ngoc Hai Tran, Quang Bang Tao, Tan Tien Huynh, Xuan Tuy Tran, and Nhu Thanh Vo</i>	
A Large Neighborhood Search Heuristic for the Cumulative Scheduling Problem with Time-Dependent Resource Availability . . . . .	707
<i>Nhan-Quy Nguyen, Farouk Yalaoui, Lionel Amodéo, and Hicham Chehade</i>	
Solving the Unrelated Parallel Machine Scheduling Problem with Additional Resources Using Constraint Programming . . . . .	716
<i>Taha Arbaoui and Farouk Yalaoui</i>	
<b>Author Index . . . . .</b>	<b>727</b>