# Contents

## Knowledge Representation and Reasoning

Inference and Learning in Probabilistic Argumentation .......................... 3  
*Nguyen Duy Hung*

Spatial Problem Solving in Spatial Structures ............................... 18  
*Christian Freksa, Ana-Maria Olteanu, Thomas Barkowsky, Jasper van de Ven, and Holger Schultheis*

Transfer Learning-Based Case Base Preparation for a Case-Based Reasoning-Based Decision Making Support Model in the Educational Domain ........................................ 30  
*Pham Thanh Tri, Vo Thi Ngoc Chau, and Nguyen Hua Phung*

Multi-level Search of a Knowledgebase for Semantic Parsing ............... 44  
*Anupiya Nugaliyadde, Kok Wai Wong, Ferdous Sohel, and Hong Xie*

Design of a Cloud Brokerage Architecture Using Fuzzy Rough Set Technique ................................................................. 54  
*Parwat Singh Anjana, Rajeev Wankar, and C. Raghavendra Rao*

Generating Tutorial Interventions for Teaching Situation Awareness in Dental Surgery – Preliminary Report .............................. 69  
*Narumol Vannaprathip, Peter Haddawy, Holger Schultheis, and Siriwan Suebnukarn*

## Data Mining and Machine Learning

Validation of Machine Learning Classifiers Using Metamorphic Testing and Feature Selection Techniques ........................................ 77  
*Sadam Al-Azani and Jameleddine Hassine*

Packer Identification Using Hidden Markov Model .............................. 92  
*Nguyen Minh Hai and Quan Thanh Tho*

AIC-Driven Spatial Hierarchical Clustering: Case Study for Malaria Prediction in Northern Thailand .................................................. 106  
*Peter Haddawy, Myat Su Yin, Tanawan Wisanrakkit, Rootrada Limsupavanich, Promporn Promrat, and Saranath Lawpoolsri*

Multivariate Time Series Clustering Analysis for Human Balance Data . . . . 112  
*Owais Ahmed Malik and Daphne Teck Ching Lai*
Analysis of District-Level Monsoon Rainfall Patterns in India: A Pilot Study .............................................. 126
   Sougata Deb, Cleta Milagros Libre Acebedo, Jun Yu, Gomathypriya Dhanapal, and Niranchana Periasamy

Deep Learning and Its Applications

Facial Expression Recognition Using a Hybrid CNN–SIFT Aggregator ...... 139
   Tee Connie, Mundher Al-Shabi, Wooi Ping Cheah, and Michael Goh

Visual-Only Word Boundary Detection ............................................. 150
   Muhammad Rizki Aulia Rahman Maulana, Retno Larasati, and Mohamad Ivan Fanany

Combination of Domain Knowledge and Deep Learning for Sentiment Analysis ............................................. 162
   Khuong Vo, Dang Pham, Mao Nguyen, Trung Mai, and Tho Quan

Hierarchical Attention Network with XGBoost for Recognizing Insufficiently Supported Argument ............................. 174
   Derwin Suhartono, Aryo Pradipta Gema, Suhendro Winton, Theodorus David, Mohamad Ivan Fanany, and Aniati Murni Arymurthy

Speed Invariant Bearing Fault Characterization Using Convolutional Neural Networks ............................................. 189
   Dileep Kumar Appana, Wasim Ahmad, and Jong-Myon Kim

Neural Network Control Method for Mobile Robot Trajectory Tracking ...... 199
   Pan Yang, Sheng Han, and Youfang Lin

What Does a Policy Network Learn After Mastering a Pong Game? .......... 213
   Somnuk Phon-Amnuaisuk

Document Analysis

Minimally-Supervised Sentiment Lexicon Induction Model:
A Case Study of Malay Sentiment Analysis ......................................... 225
   Mohammad Darwich, Shahrul Azman Mohd Noah, and Nazlia Omar

Analysis of the Reforming Languages by Image-Based Variations of LBP and NBP Operators ............................................. 238
   Darko Brodić, Alessia Amelio, Radmila Janković, and Zoran N. Milivojević
Usability Analysis of the Image and Interactive CAPTCHA via Prediction of the Response Time ................................................. 252
Darko Brodić, Alessia Amelio, Nadeem Ahmad, and Syed Khuram Shahzad

Generating Children’s Stories from Character and Event Models .............. 266
Bianca Trish Adolfo, Jerson Lao, Joanna Pauline Rivera, John Zem Talens, and Ethel Chua Joy Ong

Text Dimensionality Reduction for Document Clustering Using Hybrid Memetic Feature Selection ............................................. 281
Ibraheem Al-Jadir, Kok Wai Wong, Chun Che Fung, and Hong Xie

Intelligent Information Systems

Location-Based Services for Surrounding Area with Myanmar Language on Mobile Devices ...................................................... 293
Myat Thiri Khine and Myint Myint Sein

Processing and Monitoring Algorithm for Solar-Powered Smart Home in DC-Environment System Based on RF-Radio Node ................. 304

GuARD: A Real-Time System for Detecting Aggressive Human Behavior in Cage Environment ...................................................... 315
Phooi Yee Lau, Hock Woon Hon, Zulaikha Kadim, and Kim Meng Liang

DREAD-R: Severity Assessment of ONOS SDN Controller .......................... 323
Muhammad Shakil, Alaelddin Fuad Yousif Mohammed, Hyeontaek Oh, and Jun Kyun Choi

Formal Specifications and Analysis of an Agent-Based Model for Cognitive Aspects of Fear of Crime ............................................ 331
Azizi Ab Aziz, Ahmad Hanis Mohd Shabli, and Hayder M.A. Ghanimi

An Anytime Algorithm for Scheduling Tasks for Multiagent Systems ........ 346
Chattrakul Sombattheera

Hybrid Model with Margin-Based Real-Time Face Detection and Tracking ................................................................. 360
Bacha Rehman, Ong Wee Hong, and Abby Tan Chee Hong

Smart LED Street Light Systems: A Bruneian Case Study ..................... 370
Dk Nur Siti Khadhijah Pg Ali Kumar, Thien Wan Au, and Wida Susanty Suhaiali
Optimal Route Assessment for Emergency Vehicles Travelling on Complex Road Network .............................................................. 380

K-zin Phyo and Myint Myint Sein

Pasang Emas: An AI Implementation of Brunei’s Ancient Traditional Game .............................................................. 391

Pg. Hj. Asmali Pg. Badarudin

Swarm Intelligence

Swap-Based Discrete Firefly Algorithm for Traveling Salesman Problem . . . 409

How Siang Chuah, Li-Pei Wong, and Fadratul Hafinaz Hassan

An Efficient New Memetic Method for the Traveling Salesman Problem with Time Windows ....................................................... 426

Boldizsár Tüü-Szabó, Péter Földesi, and László T. Kóczy

A Novel Approach of Set-Based Particle Swarm Optimization with Memory State .............................................................. 437

Michiharu Maeda and Takahiro Hino

A Spy Search Mechanism (SSM) for Memetic Algorithm (MA) in Dynamic Environments .............................................................. 450

Stephen M. Akandwanaho and Serestina Viriri

Hybrid Simulated Annealing for the Bi-objective Quadratic Assignment Problem .............................................................. 462

Mohamed Saifullah Hussin and Thomas Stützle

Solving the Manufacturing Cell Design Problem Using the Artificial Bee Colony Algorithm .............................................................. 473

Ricardo Soto, Broderick Crawford, Leandro Vásquez, Roberto Zulantay, Ana Jaime, Maykol Ramirez, and Boris Almonacid

Evolving 3D Models Using Interactive Genetic Algorithms and L-Systems .............................................................. 485

Mariatul Kiptiah binti Ariffin, Shiqah Hadi, and Somnuk Phon-Amnuaisuk

Author Index .................................................. 495
Multi-disciplinary Trends in Artificial Intelligence
Phon-Amnuaisuk, S.; Ang, S.-P.; Lee, S.-Y. (Eds.)
2017, XVI, 496 p. 184 illus., Softcover
ISBN: 978-3-319-69455-9