## Contents

**Soft Computing**

**Cluster Validation Analysis on Attribute Relative of Soft-Set Theory**
Rabiei Mamat, Ahmad Shukri Mohd Noor, Tutut Herawan, and Mustafa Mat Deris  

**Optimizing Weights in Elman Recurrent Neural Networks with Wolf Search Algorithm**
Nazri Mohd. Nawi, M.Z. Rehman, Norhamreeza Abdul Hamid, Abdullah Khan, Rashid Naseem, and Jamal Uddin  

**Optimization of ANFIS Using Artificial Bee Colony Algorithm for Classification of Malaysian SMEs**
Mohd. Najib Mohd. Salleh, Kashif Hussain, Rashid Naseem, and Jamal Uddin  

**Forecasting of Malaysian Oil Production and Oil Consumption Using Fuzzy Time Series**
Riswan Efendi and Mustafa Mat Deris  

**A Fuzzy TOPSIS with Z-Numbers Approach for Evaluation on Accident at the Construction Site**
Nurnadiah Zamri, Fadhilah Ahmad, Ahmad Nazari Mohd Rose, and Mokhairi Makhtar  

**Formation Control Optimization for Odor Localization**
Bambang Tutuko, Siti Nurmaini, Rendyansyah, P.P. Aditya, and Saparudin  

**A New Search Direction for Broyden’s Family Method in Solving Unconstrained Optimization Problems**
Mohd Asrul Hery Ibrahim, Zailani Abdullah, Mohd Ashlyzan Razik, and Tutut Herawan
Improved Functional Link Neural Network Learning Using Modified Bee-Firefly Algorithm for Classification Task ....................... 71
Yana Mazwin Mohd Hassim, Rozaida Ghazali, and Noorhaniza Wahid

Artificial Neural Network with Hyperbolic Tangent Activation Function to Improve the Accuracy of COCOMO II Model ............... 81
Sarah Abdulkarem Alshalif, Noraini Ibrahim, and Tutut Herawan

A Study of Data Imputation Using Fuzzy C-Means with Particle Swarm Optimization ............................................. 91
Nurul Ashikin Samat and Mohd Najib Mohd Salleh

Utilizing Clonal Selection Theory Inspired Algorithms and K-Means Clustering for Predicting OPEC Carbon Dioxide Emissions from Petroleum Consumption ........................................... 101
Ayodele Lasisi, Rozaida Ghazali, and Haruna Chiroma

One-Way ANOVA Model with Fuzzy Data for Consumer Demand .... 111
Pei Chun Lin, Nureize Arbaiy, and Isredza Rahmi Abd. Hamid

Chicken S-BP: An Efficient Chicken Swarm Based Back-Propagation Algorithm .................................................. 122
Abdullah Khan, Nazri Mohd Nawi, Rahmat Shah, Nasreen Akhter, Atta Ullah, M.Z. Rehman, Norhamreeza AbdulHamid, and Haruna Chiroma

A Review on Violence Video Classification Using Convolutional Neural Networks ................................................... 130
Ashikin Ali and Norhalina Senan

Modified Backpropagation Algorithm for Polycystic Ovary Syndrome Detection Based on Ultrasound Images ................. 141
Untari N. Wisesty, Jondri Nasri, and Adiwijaya

An Implementation of Local Regression Smoothing on Evolving Fuzzy Algorithm for Planting Calendar Forecasting Based on Rainfall ...... 152
Arizal Akbar Rahma Saputro, Fhira Nhita, and Adiwijaya

Chebyshev Multilayer Perceptron Neural Network with Levenberg Marquardt-Back Propagation Learning for Classification Tasks ...... 162
Umer Iqbal and Rozaida Ghazali

Computing the Metric Dimension of Hypercube Graphs by Particle Swarm Optimization Algorithms .................. 171
Danang Triantoro Murdiansyah and Adiwijaya

Non-linear Based Fuzzy Random Regression for Independent Variable Selection ...................................................... 179
Mohd Zaki Mohd Salikon and Nureize Arbaiy
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Series Forecasting Using Ridge Polynomial Neural Network</td>
<td>189</td>
</tr>
<tr>
<td>with Error Feedback</td>
<td></td>
</tr>
<tr>
<td>Waddah Waheeb, Rozaida Ghazali, and Tutut Herawan</td>
<td></td>
</tr>
<tr>
<td>Training ANFIS Using Catfish-Particle Swarm Optimization for</td>
<td>201</td>
</tr>
<tr>
<td>Classification</td>
<td></td>
</tr>
<tr>
<td>Norlida Hassan, Rozaida Ghazali, and Kashif Hussain</td>
<td></td>
</tr>
<tr>
<td>Data Mining</td>
<td></td>
</tr>
<tr>
<td>FCA-ARMM: A Model for Mining Association Rules from Formal Concept</td>
<td>213</td>
</tr>
<tr>
<td>Analysis</td>
<td></td>
</tr>
<tr>
<td>Zailani Abdullah, Md Yazid Mohd Saman, Basyirah Karim,</td>
<td></td>
</tr>
<tr>
<td>Tutut Herawan, Mustafa Mat Deris, and Abdul Razak Hamdan</td>
<td></td>
</tr>
<tr>
<td>ELP-M2: An Efficient Model for Mining Least Patterns from Data</td>
<td>224</td>
</tr>
<tr>
<td>Repository</td>
<td></td>
</tr>
<tr>
<td>Zailani Abdullah, Amir Ngah, Tutut Herawan, Noraziah Ahmad,</td>
<td></td>
</tr>
<tr>
<td>Siti Zaharah Mohamad, and Abdul Razak Hamdan</td>
<td></td>
</tr>
<tr>
<td>Integration of Self-adaptation Approach on Requirements Modeling</td>
<td>233</td>
</tr>
<tr>
<td>Aradea, Iping Supriana, Kridanto Surendro, and Irfan Darmawan</td>
<td></td>
</tr>
<tr>
<td>Detection of Redundancy in CFG-Based Test Cases Using Entropy</td>
<td>244</td>
</tr>
<tr>
<td>Noor Fardzilawati Md Nasir, Noraini Ibrahim, and Tutut Herawan</td>
<td></td>
</tr>
<tr>
<td>Variety of Approaches in Self-adaptation Requirements: A Case Study</td>
<td>253</td>
</tr>
<tr>
<td>Aradea, Iping Supriana, Kridanto Surendro, and Irfan Darmawan</td>
<td></td>
</tr>
<tr>
<td>Dynamic Trackback Strategy for Email-Born Phishing Using Maximum</td>
<td>263</td>
</tr>
<tr>
<td>Dependency Algorithm (MDA)</td>
<td></td>
</tr>
<tr>
<td>Isredza Rahmi A. Hamid, Noor Azah Samsudin, Aida Mustapha,</td>
<td></td>
</tr>
<tr>
<td>and Nureize Arbaiy</td>
<td></td>
</tr>
<tr>
<td>A Case Based Methodology for Problem Solving Aiming at Knee</td>
<td>274</td>
</tr>
<tr>
<td>Osteoarthritis Detection</td>
<td></td>
</tr>
<tr>
<td>Marisa Esteves, Henrique Vicente, José Machado, Victor Alves,</td>
<td></td>
</tr>
<tr>
<td>and José Neves</td>
<td></td>
</tr>
<tr>
<td>Preliminary Study for the Implementation of Electrical Capacitance</td>
<td>285</td>
</tr>
<tr>
<td>Volume Tomography (ECVT) to Display Fruit Content</td>
<td></td>
</tr>
<tr>
<td>Riza Agustiansyah, Rohmat Saedudin, and Mahfudz Al Huda</td>
<td></td>
</tr>
<tr>
<td>Dependency Scheme for Revise and Reasoning Solution</td>
<td>294</td>
</tr>
<tr>
<td>Wiwin Suwarningsih, Ayu Purwarianti, and Iping Supriana</td>
<td></td>
</tr>
<tr>
<td>A New Binary Similarity Measure Based on Integration of the Strengths</td>
<td>304</td>
</tr>
<tr>
<td>of Existing Measures: Application to Software Clustering</td>
<td></td>
</tr>
<tr>
<td>Rashid Naseem and Mustafa Mat Deris</td>
<td></td>
</tr>
</tbody>
</table>
A Comparative Study of Linear and Nonlinear Regression Models for Outlier Detection ...................................................... 316
Paul Inuwa Dalatu, Anwar Fitrianto, and Aida Mustapha

Clustering Based on Classification Quality (CCQ) .................. 327
Iwan Tri Riyadi Yanto, Rd Rohmat Saedudin, Dedy Hartama,
and Tutut Herawan

A Framework of Clustering Based on Chicken Swarm Optimization . . . 336
Nursyiiva Irsalinda, Iwan Tri Riyadi Yanto, Haruna Chiroma,
and Tutut Herawan

Histogram Thresholding for Automatic Color Segmentation Based on k-means Clustering .................................................. 344
Adhi Prahara, Iwan Tri Riyadi Yanto, and Tutut Herawan

Does Number of Clusters Effect the Purity and Entropy of Clustering? . . 355
Jamal Uddin, Rozaida Ghazali, and Mustafa Mat Deris

Text Detection in Low Resolution Scene Images Using Convolutional
Neural Network .......................................................... 366
Anhar Risnumawan, Indra Adji Sulistijono, and Jemal Abawajy

Handling Imbalanced Data in Churn Prediction Using RUSBoost and Feature Selection (Case Study: PT.Telekomunikasi Indonesia Regional 7) ................................................................. 376
Erna Dwiyanti, Adiwijaya, and Arie Ardiyanti

Extended Local Mean-Based Nonparametric Classifier for Cervical
Cancer Screening .......................................................... 386
Noor Azah Samsudin, Aida Mustapha, Nureize Arbaiy, and Isredza Rahmi A. Hamid

Adaptive Weight in Combining Color and Texture Feature in Content Based Image Retrieval .................................................. 396
Ema Rachmawati, Mursil Shadruddin Afkar, and Bedy Purnama

WordNet Gloss for Semantic Concept Relatedness .................... 406
Moch Arif Bijaksana and Rakhmad Indra Permadi

Difference Expansion-Based Data Hiding Method by Changing Expansion Media .............................................................. 414
Tohari Ahmad, Diksy M. Firmansyah, and Dwi S. Angreni

Ensemble Methods and their Applications

A New Customer Churn Prediction Approach Based on Soft Set Ensemble Pruning .......................................................... 427
Mohd Khalid Awang, Mokhairi Makhtar, Mohd Nordin Abd Rahman,
and Mustafa Mat Deris
An Association Rule Mining Approach in Predicting Flood Areas
Mokhairi Makhtar, Nur Ashikin Harun, Azwa Abd Aziz, Zahrahtul Amani Zakaria, Fadzli Syed Abdullah, and Julaily Aida Jusoh

437

The Reconstructed Heterogeneity to Enhance Ensemble Neural Network for Large Data
Mumtazimah Mohamad, Mokhairi Makhtar, and Mohd Nordin Abd Rahman

447

A New Mobile Malware Classification for SMS Exploitation
Nurzi Juana Mohd Zaizi, Madihah Mohd Saudi, and Adiebah Khailani

456

Data Mining Techniques for Classification of Childhood Obesity Among Year 6 School Children
Fadzli Syed Abdullah, Nor Saidah Abd Manan, Aryati Ahmad, Sharifah Wajihah Wafa, Mohd Razif Shahril, Nurzaime Zulaily, Rahmah Mohd Amin, and Amran Ahmed

465

Multiple Criteria Preference Relation by Dominance Relations in Soft Set Theory
Mohd Isa Awang, Ahmad Nazari Mohd Rose, Mohd Khalid Awang, Fadhilah Ahmad, and Mustafa Mat Deris

475

Reduce Scanning Time Incremental Algorithm (RSTIA) of Association Rules
Iyad Aqra, Muhammad Azani Hasibuan, and Tutut Herawan

485

A New Multi Objective Optimization to Improve Growth Domestic Produce of Economic Using Metaheuristic Approaches: Case Study of Iraq Economic
Ahmed Khalaf Zager Al Saedi, Rozaida Ghazali, and Mustafa Mat Deris

496

The Algorithm Expansion for Starting Point Determination Using Clustering Algorithm Method with Fuzzy C-Means
Edrian Hadinata, Rahmat W. Sembiring, Tien Fabrianti Kusumasari, and Tutut Herawan

506

On Mining Association Rules of Real-Valued Items Using Fuzzy Soft Set
Dede Rohidin, Noor A. Samsudin, and Tutut Herawan

517

Application of Wavelet De-noising Filters in Mammogram Images Classification Using Fuzzy Soft Set
Saima Anwar Lashari, Rosziati Ibrahim, Norhalina Senan, Iwan Tri Riyadi Yanto, and Tutut Herawan

529

Design Selection of In-UVAT Using MATLAB Fuzzy Logic Toolbox
Haris Rachmat, Tatang Mulyana, Sulaiman bin H. Hasan, and Mohd. Rasidi bin Ibrahim

538
Web Mining, Services and Security

A Web Based Peer-to-Peer RFID Architecture .......................... 549
Harinda Fernando and Hairulnizam Mahdin

Performance-Aware Trust-Based Access Control for Protecting
Sensitive Attributes .......................................................... 560
Mohd Rafiz Salji, Nur Izura Udziir, Mohd Izuan Hafez Ninggal,
Nor Fazlida Mohd. Sani, and Hamidah Ibrahim

E-Code Checker Application ........................................... 570
Shahreen Kasim, Ummi Aznazirah Azahar, Noor Azah Samsudin,
Mohd Farhan Md Fudzee, Hairulnizam Mahdin,
Azizul Azhar Ramli, and Suriawati Suparjoh

Factors Influencing the Use of Social Media in Adult
Learning Experience .......................................................... 579
Masitah Ahmad, Norhayati Hussin, Syafiq Zulkarnain,
Hairulnizam Mahdin, and Mohd Farhan Md. Fudzee

A Framework to Analyze Quality of Service (QoS) for Text-To-Speech
(TTS) Services .............................................................. 589
Mohd Farhan Md Fudzee, Mohamud Hassan, Hairulnizam Mahdin,
Shahreen Kasim, and Jemal Abawajy

Indoor Navigation Using A* Algorithm ................................. 598
Shahreen Kasim, Loh Yin Xia, Norfaradilla Wahid,
Mohd Farhan Md Fudzee, Hairulnizam Mahdin, Azizul Azhar Ramli,
Suriawati Suparjoh, and Mohamad Aizi Salamat

Mining Significant Association Rules from on Information
and System Quality of Indonesian E-Government Dataset .......... 608
Deden Witarsyah Jacob, Mohd Farhan Md Fudzee,
Mohamad Aizi Salamat, Rohmat Saedudin, Zailani Abdullah,
and Tutut Herawan

A Feature Selection Algorithm for Anomaly Detection in Grid
Environment Using k-fold Cross Validation Technique .......... 619
Dahliyusmanto, Tutut Herawan, Syefrida Yulina,
and Abdul Hanan Abdullah

Soft Set Approach for Clustering Graduated Dataset ............... 631
Rd Rohmat Saedudin, Shahreen Binti Kasim,
Hairulnizam Mahdin, and Muhammad Azani Hasibuan
An Application of Rough Set Theory for Clustering Performance Expectancy of Indonesian e-Government Dataset .................. 638
Deden Witarsyah Jacob, Mohd Farhan Md. Fudzee, Mohamad Aizi Salamat, Rd Rohmat Saedudin, Iwan Tri Riyadi Yanto, and Tutut Herawan

Erratum to: Text Detection in Low Resolution Scene Images Using Convolutional Neural Network ........................................ E1
Anhar Risnumawan, Indra Adji Sulistijono, and Jemal Abawajy

Author Index ............................................................. 647
Recent Advances on Soft Computing and Data Mining
The Second International Conference on Soft Computing and Data Mining (SCDM-2016), Bandung, Indonesia, August 18-20, 2016 Proceedings
Herawan, T.; Ghazali, R.; Nawi, N.M.; Deris, M.M. (Eds.)
2017, XXI, 649 p. 201 illus., 113 illus. in color., Softcover
ISBN: 978-3-319-51279-2