

# **2008 4th International Conference on Information and Automation for Sustainability**

**(ICIAfS)**

**Colombo, Sri Lanka  
12 – 14 December 2008**



**IEEE Catalog Number: CFP0809B-PRT  
ISBN: 978-1-4244-2899-1**

# TABLE OF CONTENTS

|  |    |
|--|----|
| <b>An Efficient Global Optimization Approach to Multi Robot Path Exploration Problem Using Hybrid Genetic Algorithm .....</b>                  | 1  |
| <i>Bharadwaj K. K., Senthilkumar K.S.</i>  |    |
| <b>Compensator Design by Pole-Zero Adjustment for a Typical Position Control System .....</b>  | 7  |
| <i>Shanmugasundram R., Ganesh C., Yadaiah N., Poornaselvan K.J.</i>  |    |
| <b>Simultaneous Localization and Mapping: A Pseudolinear Kalman Filter (PLKF) Approach.....</b>  | 13 |
| <i>Pathiranga Chandima Dedduwa, Watanabe Keigo, Jayasekara Buddhika, Izumi Kiyotaka</i>  |    |
| <b>Centralized Traffic Controlling System for Sri Lanka Railways .....</b>   | 19 |
| <i>Ambegoda A.L.A.T.D., De Silva W.T.S., Hemachandra K.T., Samarasinghe T.N., Samarasinghe A.T.L.K.</i>  |    |
| <b>A Paraconsistent Logic Program bf-EVALPSN and its Application to Process Order Control .....</b>  | 24 |
| <i>Nakamatsu Kazumi, Akama Seiki, Abe Jair Minoro</i>  |    |
| <b>Predicting the Thermal Conductivity of Nanofluids Based on Suspension Viscosity.....</b>  | 30 |
| <i>Chen Haisheng, Witharana Sanjeeva, JIN Yi, Ding Yulong, Kim Chongyoup</i>   |    |
| <b>A Novel Parser Design Algorithm Based on Artificial Ants .....</b>  | 36 |
| <i>Maiti Deepyaman, Acharya Ayan, Konar Amit, Ramadoss Janarathanan</i>  |    |
| <b>Efficient Utilization of Employees in the Garment Industry Using Operations Research .....</b>  | 40 |
| <i>Fernando W.K.I., Suriyaarachchi D.J.C.</i>  |    |
| <b>A Novel Approach for Automation of Precision Calibration Process .....</b>  | 44 |
| <i>Li Na, Liu Qin, Wang Lili, Liu Xiaoyi</i>   |    |
| <b>Remote Monitoring and Controlling System for a Water Purification Plant.....</b>  | 49 |
| <i>Thalakatuna D.N.P., Tilakaratne T.A.T., Jayasinghe Y.B.M.S, Silva T.H.K.M, Munasinghe S.R.</i>  |    |
| <b>Space Complexity Optimization for Nano Electronic Devices Based on Evolutionary Computation .....</b>                                       | 55 |
| <i>Jazbec Andrej, Zimic Nikolaj, Pecar Primoz, Bajec Iztok Lebar, Mraz Miha</i>  |    |
| <b>Design and Simulation of a UAV Controller System with High Maneuverability .....</b>  | 60 |
| <i>Tennakoon W.T.M.S., Munasinghe S.R.</i>   |    |
| <b>A Study of the Grunwald-Letnikov Definition for Minimizing the Effects of Random Noise on Fractional Order Differential Equations .....</b> | 66 |
| <i>Chakraborty Mithun, Maiti Deepyaman, Konar Amit, Janarathanan Ramadoss</i>  |    |
| <b>Tuning PID and PI<math>\Delta</math>D<math>\delta</math> Controllers using the Integral Time Absolute Error Criterion .....</b>             | 74 |
| <i>Maiti Deepyaman, Acharya Ayan, Chakraborty Mithun, Konar Amit, Janarathanan Ramadoss</i>  |    |
| <b>Characteristics of Sonar Range Sensor SRF05.....</b>  | 80 |
| <i>Wickramasooriya A., Hamilan G., Jayawardena S.I.L., Wijemanne W.M.D.L.W., Munasinghe S.R.</i>   |    |
| <b>A New E-Government System by Documenting Information .....</b>  | 86 |
| <i>Kargar Masoud, Fartash Farzaneh, Saderi Taha, Ghanbarzadeh Reza</i>   |    |
| <b>Dimensions of eTransformation.....</b>  | 90 |
| <i>Hol Ana, Ginige Athula</i>  |    |
| <b>Modeling TVET Institutes as Learning Organizations.....</b>   | 96 |
| <i>Guruge Rajeevi, Arunatileka Shiromi</i>   |    |

|   |     |
|---|-----|
| <b>Internal Structure and Semantic Web Link Structure Based Ontology Ranking</b> .....  | 103 |
| <i>Rajapaksha Samantha, Nuwan Kodagoda</i>  |     |
| <b>Using swarm Intelligence to perceive the Semantic Web</b> .....  | 108 |
| <i>Ratnayake Sanjaya, Rupasinghe Ruvindee, Ranatunga Anuruddha, De Zoysa Sajayahan, Adikari Shalinda, Tennakoon Kamala, Karunananda Asoka</i>   |     |
| <b>Adaptive Distributed Job Scheduler for Java Compute Servers</b> .....  | 114 |
| <i>Kalawila W. D. I. A., Ranasinghe D.N.</i>  |     |
| <b>Collaboration Opportunities in Second Life:- Collective Experiences</b> .....  | 119 |
| <i>Hansen Steve, Griffith Sharon, Ademagic Miko, Armitage Chris, Faulkner Tim, Gavrilovic Nemanja, Lock Lawrence, Miltiadis Simone, Ramnath Pranav, Turdush Malik, Sebastian Rob, Whitaker Matt, Hansen Chris</i> |     |
| <b>Comparing the User-Interface Design of Banking Websites, A Survey on the Sri Lankan Banking Sector</b> .....   | 125 |
| <i>Ranawaka R A K</i>   |     |
| <b>A Blend of Adaptive and Digital Learning Towards Language Proficiency</b> .....  | 131 |
| <i>Wickremaratne Jagath, Wimalaratne Geethanjali, Goonetilleke Vineeta</i>  |     |
| <b>Developing a Collaborative Map Creation Support System by Multi-modal Information-gathering</b> .....  | 137 |
| <i>Terashima Takanori, Sekizuka Hisako, Sasaki Tamae</i>  |     |
| <b>Knowledge Management Implications in ERP Implementations: Evidence from Sri Lankan Cases</b> .....   | 142 |
| <i>Suraweera Theekshana, Mahagederawatte Suvimali, Kahandawaarachchi Chathurangika, Hewamallikage Pulathisi, Periyapperuma Dilhan, Adipola Madurangi</i>  |     |
| <b>Quality Analysis of Side Information Refinement in Transform-Based DVC</b> .....   | 148 |
| <i>Yasakethu S.L.P., Fernando W.A.C., Badem M.B., Kondo A.M.</i>  |     |
| <b>Region-of-Activity Based Coding for Transform Domain DVC</b> .....   | 154 |
| <i>Badem M.B., Fernando W.A.C., Weerakkody W.A.R.J., Yasakethu S.L.P., Kondo A.M.</i>   |     |
| <b>Privacy Preserving Clustering by Cluster Bulging for Information Sustenance</b> .....  | 158 |
| <i>Kadampur Mohammad Ali, Somayajulu D.V.L.N., Dhiraj S. S.Shivaji, Satyam Shailesh G.P.</i>  |     |
| <b>SmartBee, Multichannel Access ZigBee Gateway with Plug and Play Device Interface for Smart Home/Office Automation</b> .....  | 165 |
| <i>De Silva G.S.H., De Silva L.W.R.M., Ishara P.W.K., Kumara M.P.H.S., Ginige Thilak</i>  |     |
| <b>A Framework to Enhance Email based Business Processes</b> .....  | 171 |
| <i>Sumanadasa Sujani Samannadie, Ginige Jeewani Anupama</i>   |     |
| <b>Non-Repudiation Framework for E-Government Applications</b> .....  | 177 |
| <i>Peiris Hasala, Soysa Lakshan, Palliyaguru Rohana</i>   |     |
| <b>Social Impact of SMS in Sri Lanka</b> .....  | 184 |
| <i>Wijetunge Sumudu, Wijesinghe Pushpika, Gunawardana Upul</i>  |     |
| <b>Carrier Frequency Offset Estimation for OFDM System using Extended Kalman Filter</b> .....   | 189 |
| <i>Senevirathna Sankassa B., Jayawardena Chandimal, Perera Sumudu S., Perera Chandima L., Ranasinghe Dhanushka, Wijerathna Sureni R., Bandara Thisara N.</i>  |     |
| <b>Architecture for Secure Knowledge Management over the Network</b> .....  | 193 |
| <i>Das Vinu V.</i>  |     |
| <b>Critical Review of Data Mining Techniques for Gene Expression Analysis</b> .....   | 198 |
| <i>Aouf Mazin, Liyanage Liwan, Hansen Stephen</i>   |     |
| <b>A Model to eTransform SMEs in Developing Countries</b> .....   | 203 |
| <i>Kapurubandara Mahesha</i>  |     |

|   |     |
|---|-----|
| <b>Axis2UNO: Web Services Enabled Openoffice.org</b> .....  | 209 |
| <i>Bambarasinghe B.A.N.M., Huruggamuwa H.M.S., Ragel R.G., Radhakrishnan S.</i>   |     |
| <b>Mathematical Processing of Syslog Messages from Routers and Switches</b> .....   | 215 |
| <i>Slavicek Karel, Ledvinka Jaroslav, Javornik Michal, Dostal Otto</i>  |     |
| <b>A Roadmap, Methodology and Technology Framework to Support eTransformation</b> .....   | 221 |
| <i>Ginige Athula</i>  |     |
| <b>A Rule Based Approach to Modeling the Effect of Tobacco Control Policies</b> .....   | 227 |
| <i>Ding Xiaojiang, Bedingfield Susan, Yeh Chung-Hsing, Lazarevic Sonja Petrovic, Coghill Ken, Zhang Jian Ying, Borland Ron, Young David</i> |     |
| <b>Interactive Dialogue for Behavior Teaching to Robots based on Primitive Behaviors with Fuzzy Voice Commands</b> .....                    | 233 |
| <i>Jayasekara Buddhika, Watanabe Keigo, Izumi Kiyotaka</i>  |     |
| <b>Role of the Context in Intuitive Combination of Evidence</b> .....   | 239 |
| <i>Senaratne Damith, Kulasekere Chulantha</i>   |     |
| <b>Analysis of Video Content in Multi Codec Formats with Compacted Dither Coding</b> .....  | 246 |
| <i>Ranathunga Lochandaka, Zainuddin Roziati, Abdullah Nor Aniza</i>   |     |
| <b>Web-based English-Sinhala Translator in Action</b> .....   | 253 |
| <i>Hettige Buddhitha, Karunananda Asoka</i>   |     |
| <b>Feature based Stereo Correspondence using Moment Invariant</b> .....   | 259 |
| <i>Premaratne Prashan, Safaei Farzad</i>  |     |
| <b>A Multi-Mutation Pattern Immune Network for Intrusion Detection</b> .....  | 264 |
| <i>Zhao Linhui, Dai Yaping, Fang Xin</i>  |     |
| <b>Image Gradient Estimation with Wide Support Kernels</b> .....  | 270 |
| <i>Senel Hakan Guray</i>  |     |
| <b>A Natural Algorithmic Approach to the Structural Optimisation of Neural Networks</b> .....   | 276 |
| <i>Suraweera N. P., Ranasinghe D.N.</i>   |     |
| <b>A Data Mining Algorithm to Analyse Stock Market Data Using Lagged Correlation</b> .....  | 283 |
| <i>Liyanaage Liwan, Fonseka Cicil</i>   |     |
| <b>Classification of Protein Sequences using the Growing Self-Organizing Map</b> .....  | 287 |
| <i>Ahmad Norashikin, Alahakoon Damminda, Chau Rowena</i>  |     |
| <b>An Approach to Develop Multi Techniques Integrated Expert System For Diagnosis Of Human Constitutions</b> .....                          | 293 |
| <i>Mendis D.S. Kalana, Karunananda Asoka, Samaratunga U.</i>  |     |
| <b>Evidence Theory based Decision Fusion for Masquerade Detection in IEC61850 Automated Substations</b> .....                               | 297 |
| <i>Premaratne Upeka, Samarabandu Jagath, Sidhu Tarlochan, Beresh Bob, Tan Jiang-chen</i>  |     |
| <b>Extended Visual Object based Intelligent Visual Programming Environment</b> .....  | 303 |
| <i>Ahmed P., Ahmadi S.</i>  |     |
| <b>Analysis of Grasping and Slip Detection of the Human Hand</b> .....  | 309 |
| <i>Edussooriya C. U. S., Hapuachchi H. S. S., Rajiv D., Ranasinghe R. A. H., Munasinghe S. R.</i>   |     |
| <b>Minimum Kurtosis CMA Deconvolution for Blind Image Restoration</b> .....   | 315 |
| <i>Samarasinghe Pradeepa D., Kennedy Rodney A.</i>  |     |
| <b>Determination of Maximum Possible Fuel Economy of HEV for Known Drive Cycle: Genetic Algorithm Based Approach</b> .....                  | 321 |
| <i>Wimalendra R. Sudath, Udawatta Lanka, Edirisinghe E. M. C. P., Karunarathna Sudarshana</i>   |     |

|  |            |
|--|------------|
| <b>Traffic Signal Control Based on Adaptive Neuro-Fuzzy Inference .....</b>  | <b>327</b> |
| <i>Wannige C. T., Sonnadara D.U.J.</i>   |            |
| <b>VoizLock – Human Voice Authentication System using Hidden Markov Model .....</b>  | <b>333</b> |
| <i>Jayamaha R G Maduranga M, Senadheera Maduri R R, Gamage T Nuwan C, Weerasekara K D<br/>Pavithra B, Dissanayaka Gayan A, Kodagoda G. Nuwan</i>                 |            |
| <b>Fast Nonparametric Image Segmentation with Dirichlet Processes .....</b>  | <b>339</b> |
| <i>Wimalawarne K. A. D. N. K.</i>  |            |
| <b>Deterministic Model for Analyzing the Dynamics of Ant System Algorithm and<br/>Performance Amelioration through a New Pheromone Deposition Approach .....</b> | <b>344</b> |
| <i>Acharya Ayan, Maiti Deepyaman, Konar Amit, Ramadoss Janarthanam</i>   |            |
| <b>Visual Tracking of Vehicles using Multiresolution Analysis and Neural Network .....</b>   | <b>349</b> |
| <i>Fernando Shehan, Udawatta Lanka, Pathirana Pubudu</i>   |            |
| <b>Eigenface Based Automatic Facial Feature Tagging.....</b>   | <b>355</b> |
| <i>Wijeratne Suranga, Jayawardena Supul, Jayasooriya Srimal, Lokupathirage Dulanjan, Patternot<br/>Menuwan, Kodagoda G. Nuwan</i>                                |            |
| <b>Learning Qualitative Relations in Real World Scenes.....</b>  | <b>361</b> |
| <i>Ranasinghe D.D.M., Karunananda Asoka, Ratnayake U.</i>  |            |
| <b>Sinhala to English Language Translator.....</b>   | <b>367</b> |
| <i>De Silva Dilshan, Alahakoon Asanga, Udayangani Imesha, Kumara Vishva, Kolonnage Devinda,<br/>Perera Harindu, Thelijagoda Samantha</i>                         |            |
| <b>Investigating the Effect of Illumination and Viewpoint on Image Recognisability .....</b>   | <b>373</b> |
| <i>Alahakoon Dammina, Bamunusinghe Jeewanee</i>  |            |
| <b>Self Learning and its Implications for Machine Understanding.....</b>   | <b>378</b> |
| <i>Dinalankara Wikum, De Silva Daswin, Alahakoon Dammina</i>   |            |
| <b>Development of a 6DOF Exoskeleton Robot for Human Upper-Limb Motion Assist .....</b>  | <b>384</b> |
| <i>Gopura R. A. R. C., Kiguchi Kazuo</i>   |            |
| <b>Controlling a Wheelchair by Use of EOG Signal .....</b>   | <b>390</b> |
| <i>Yathunathan S., Chandrasena L. U. R., Umakanthan A., Vasuki V., Munasinghe S. R.</i>  |            |
| <b>An Analysis of Facial Morphology for the Robot Assisted Smile Recovery.....</b>   | <b>396</b> |
| <i>Jayatilake Dushyantha, Gruebler Anna, Suzuki Kenji</i>  |            |
| <b>A Fuzzy ANP Model to Assess the State of Organizational Readiness for ERP<br/>Implementation .....</b>  | <b>402</b> |
| <i>Razmi Jafar, Ghodsi Reza, Sangari Mohamad Sadegh</i>  |            |
| <b>A Hybrid Multi-criteria Decision Making Model for ERP System Selection .....</b>  | <b>410</b> |
| <i>Razmi Jafar, Sangari Mohamad Sadegh</i>   |            |
| <b>Novel Approach for RSS Calibration in DCM -based Mobile Positioning using<br/>Propagation Models .....</b>  | <b>417</b> |
| <i>Wijesinghe Pushpika, Dias Dileeka</i>   |            |
| <b>Database Correlation for GSM Location in Outdoor &amp; Indoor Environments .....</b>  | <b>423</b> |
| <i>Lakmali B.D.S., Dias Dileeka</i>  |            |
| <b>FAMA/TDMA Hybrid MAC for Wireless Sensor Networks .....</b>   | <b>429</b> |
| <i>Gajaweera Nuwan, Dias Dileeka</i>   |            |
| <b>Wireless Sensor Network Testbed for Mobile Data Communication.....</b>  | <b>435</b> |
| <i>Jayasingha D.N., Jayawardhane N.P.M.L. , Karunanayake P.N. , Karunarathne G.D. , Dias Dileeka</i>   |            |
| <b>Discovering Dynamic Vehicular Congestion using VANETs .....</b>   | <b>442</b> |
| <i>Fahmy Farazy, Ranasinghe D.N.</i>   |            |

|   |     |
|---|-----|
| <b>Application of Security Metrics in Auditing Computer Network Security: A Case Study</b> .....  | 448 |
| <i>Premaratne Upeka, Samarabandu Jagath, Sidhu Tarlochan, Beresh Bob, Tan Jiang-chen</i>  |     |
| <b>Design and Implementation of a Bluetooth based General Purpose Controlling Module</b> .....  | 454 |
| <i>Wijetunge S.P., Wijetunge U.S., Peiris G.R.V., Aluthgedara C.S, Samarasinghe A.T.L.K.</i>  |     |
| <b>Zigbee Wireless Vehicular Identification and Authentication System</b> .....   | 460 |
| <i>Dissanayake S. D., Karunasekara P. P. C. R., Lakmanarachchi D. D., Rathnayaka A. J. D., Samarasinghe A. T. L. K.</i>                                       |     |
| <b>Algorithms for Node Clustering in Wireless Sensor Networks: A Survey</b> .....   | 464 |
| <i>Kumarawadu P., Dechene D. J., Luccini M., Sauer A.</i>   |     |
| <b>An Overall Energy-Balanced Routing Protocol for Wireless Sensor Network</b> .....  | 470 |
| <i>Yang Shu-ling, Hong Li</i>   |     |
| <b>An Indoor Tracking-based Handoff Mechanism for VoIP Applications in IEEE 802.11 WLANs</b> .....  | 475 |
| <i>Lee CheolHee, Seo SungHoon, Song JooSeok</i>   |     |
| <b>Mobile-Velocity adaptive Vertical Handoff in Integrated WLAN and WiBro Networks</b> .....  | 481 |
| <i>Cha Bin, Seo SungHoon, Choi YeoMin, Song JooSeok</i>   |     |
| <b>The Blue Zone – Mobile Bluetooth Network Expansion</b> .....   | 487 |
| <i>Shafie A F R, Ikram M M M, Liyanage C S, Alahakoon A E, Liyanage N M, Kodagoda G Nuwan</i>   |     |
| <b>A Hybrid of Reactive and Proactive Approaches Based on Neighbors’ Conditions of Nodes for Mobile Ad Hoc Networks</b> .....                                 | 493 |
| <i>Dargahi Tooska, Rahmani Amir Masoud, Khademzadeh Ahmad</i>   |     |
| <b>QoS Preemptive Routing with Bandwidth Estimation for Improved Performance in Ad Hoc Networks</b> .....   | 499 |
| <i>Thriveni J, Alekhya V L, Deepa N, Uma B, Alice A, Prakash G L, Venugopal K R, Patnaik L M</i>  |     |
| <b>Sensor Fault Detection using Adaptive Modified Extended Kalman Filter Based on Data Fusion Technique</b> .....   | 505 |
| <i>Mosallaei Mohsen, Salahshoor Karim</i>   |     |
| <b>Comparison of Centralized Multi-Sensor Measurement and State Fusion Methods with an Adaptive Unscented Kalman Filter for Process Fault diagnosis</b> ..... | 511 |
| <i>Mosallaei Mohsen, Salahshoor Karim</i>   |     |
| <b>Author Index</b>   |     |