

2011 Sixth International Conference on Bio-Inspired Computing: Theories and Applications

(BIC-TA 2011)

**Penang, Malaysia
27-29 September 2011**



**IEEE Catalog Number: CFP1101F-PRT
ISBN: 978-1-4577-1092-6**

2011 Sixth International Conference on Bio-Inspired Computing: Theories and Applications

BIC-TA 2011

Table of Contents

Preface.....	xi
Conference Organization.....	xii
Technical Programme Committee.....	xiii
Local Organizing Committee.....	xv
Steering Committee.....	xvi
Reviewers.....	xvii
Sponsors.....	xviii
Keynote Abstracts.....	xix
Workshop Abstracts.....	xxiii

Evolutionary Computing

Square Function for Population Size in Quantum Evolutionary Algorithm and its Application in Fractal Image Compression	3
<i>Amin Qorbani, Ali Nodehi, Ali Ahmadi, and Saeed Nodehi</i>	
An Improved Artificial Bee Colony for Course Timetabling	9
<i>Asaju La'aro Bolaji, Ahamad Tajudin Khader, Mohammed Azmi Al-betar, and Mohammed A. Awadallah</i>	
Evolving Neural Controllers Using GA for Warcraft 3-Real Time Strategy Game	15
<i>Chang Kee Tong, Chin Kim On, Jason Teo, and Aroland MConie Jilui Kiring</i>	
The Evolution of Gamebots for 3D First Person Shooter (FPS)	21
<i>Chang Kee Tong, Ong Jia Hui, Jason Teo, and Chin Kim On</i>	
Parallel Communicating Graph Grammar	27
<i>S. Jeya Bharathi, M. Saravana Vadivu, and K. Thiagarajan</i>	
Properties of NLC Languages Squeezed with Hypercube Graphs	33
<i>S. Jeya Bharathi, M. Saravana Vadivu, and K. Thiagarajan</i>	

Improving Energy Efficiency in Cooperative Foraging Swarm Robots Using Behavioral Model	39
<i>Jong-Hyun Lee and Chang Wook Ahn</i>	
A Context Aware Personalized Media Recommendation System: An Adaptive Evolutionary Algorithm Approach	45
<i>Karthik Srinivasa Gopalan, Senthil Nathan, Bhanu Teja C.H., Ashok Babu Channa, and Prateek Saraf</i>	
Finding the Shortest Hamiltonian Circuit of Selected Places in Penang Using a Generic Bee Colony Optimization Framework	51
<i>Li-Pei Wong, Malcolm Yoke Hean Low, and Chin Soon Chong</i>	
Nurse Scheduling Using Harmony Search	58
<i>Mohammed A. Awadallah, Ahamad Tajudin Khader, Mohammed Azmi Al-Betar, and Asaju La'aro Bolaji</i>	
Coverage Maximization and Energy Conservation for Mobile Wireless Sensor Networks: A Two Phase Particle Swarm Optimization Algorithm	64
<i>Nor Azlina Ab. Aziz, Ammar W. Mohemmed, Mohamad Yusoff Alias, Kamarulzaman Ab. Aziz, and Syabeela Syahali</i>	
Prediction of Protein-Protein Interaction Using Distance Frequency of Amino Acids Grouped with their Physicochemical Properties	70
<i>Shao-Wu Zhang, Yong-Mei Cheng, Li Luo, and Quan Pan</i>	
Mass Spectrometry Analysis via Metaheuristic Optimization Algorithms	75
<i>Syarifah Adilah M.Y., Ibrahim Venkat, Rosni Abdullah, and Umi Kalsom Yusof</i>	
Halton Based Initial Distribution in Artificial Bee Colony Algorithm and Its Application in Software Effort Estimation	80
<i>Tarun Kumar Sharma and Millie Pant</i>	
Study of Communication Network Using Unilateral Graph and Grammar	85
<i>K. Thiagarajan, S. Jeyabharathi, and Ponnammal Natarajan</i>	
Machine Loading Optimization in Flexible Manufacturing System Using a Hybrid of Bio-inspired and Musical-Composition Approach	89
<i>Umi Kalsom Yusof, Rahmat Budiarto, Ibrahim Venkat, and Safaai Deris</i>	
A Practical Framework for Cleaning Robots	97
<i>Wen-Mau Chong, Chien-Le Goh, and Yoon-Teck Bau</i>	
DNA Sequences Optimization Based on Gravitational Search Algorithm for Reliable DNA Computing	103
<i>Jianhua Xiao and Zhen Cheng</i>	
Modified Clonal Selection Algorithm Based Classifiers	108
<i>Yashwant Prasad Singh and Amir Samir Hassan Babiker</i>	
A Modified Estimation of Distribution Algorithm for Numeric Optimization	114
<i>Yuquan Li, Gexiang Zhang, Xiangxiang Zeng, Jixiang Cheng, Marian Gheorghe, and Susan Elias</i>	

Neural Computing

Application of Self Organizing Map for Intelligent Machine Fault Diagnostics Based on Infrared Thermography Images	123
<i>Achmad Widodo, Djoeli Satrijo, Muhammad Huda, Gang-Min Lim, and Bo-Suk Yang</i>	
ANN Based on IncCond Algorithm for MPP Tracker	129
<i>Jinbang Xu, Anwen Shen, Cheng Yang, Wenpei Rao, and Xuan Yang</i>	
Echo State Networks Based Method for Harmonic Extraction in Shunt Active Power Filters	135
<i>Jinbang Xu, Jun Yang, Feng Liu, Zhixiong Zhang, and Anwen Shen</i>	
ANN-based Control Method Implemented in a Voltage Source Converter for Industrial Micro-grid	140
<i>Jinbang Xu, Zhizhuo Wu, Xuan Yang, Jie Ye, and Anwen Shen</i>	
A Hybrid Neural Classifier for Dimensionality Reduction and Data Visualization and Its Application to Fault Detection and Classification of Induction Motors	146
<i>Mahnoosh Nadjarpoorsiyahkaly and Chee Peng Lim</i>	
Local Positioning System Performance Evaluation with Cosine Correlation Similarity Measure	151
<i>Sham Firdaus Md. Ali and Rosilah Hassan</i>	
Multiple Input-Single Output (MISO) Feedforward Artificial Neural Network (FANN) Models for Pilot Plant Binary Distillation Column	157
<i>Z. Abdullah, Z. Ahmad, and N. Aziz</i>	

DNA Computing

Bordered Factors of a Finite Word	163
<i>V. Rajkumar Dare and C. Annal Deva Priya Darshini</i>	
Crossing-Preserved and Persistent Splicing Systems	167
<i>Fariba Karimi, Nor Haniza Sarmin, and Fong Wan Heng</i>	
DNA Computing Model Based on Photoelectric Detection System with Magnetic Beads	170
<i>Fei Li, Zheng Li, and Jin Xu</i>	
Double Hexagonal Array Splicing System	176
<i>S.M. Saroja Theerdus Kalavathy and P. Helen Chandra</i>	
Semigraph Structure on DNA Splicing System	182
<i>S. Jeya Bharathi, J. Padmashree, S. Sinthanai Selvi, and K. Thiagarajan</i>	
Double Cross - Over Circular Array Splicing	188
<i>S. Jeya Bharathi, J. Padmashree, and K. Thiagarajan</i>	
Context-Free Systems with a Complementarity Relation	194
<i>K.G. Subramanian, Ibrahim Venkat, and Kalpana Mahalingam</i>	

P Systems Based on Sticker Operations	199
<i>V. Masilamani, A.S. Prasanna Venkatesan, and D.G. Thomas</i>	
Analysis on Secure and Effective Applications of a DNA-Based Cryptosystem	205
<i>Miki Hirabayashi, Akio Nishikawa, Fumiaki Tanaka, Masami Hagiya, Hiroaki Kojima, and Kazuhiro Oiwa</i>	
Properties of Binding-Blocking Automata: A Study	211
<i>M. Sakthi Balan</i>	
Parallel Communication Synchronized Pure Pattern Grammar Systems with Filters	216
<i>Sindhu J. Kumar and P.J. Abisha</i>	
Simple Splicing Pattern and Pure Pattern Grammar Systems	220
<i>Sindhu J. Kumar, P.J. Abisha, and D.G. Thomas</i>	
Clique-Detection Algorithm Using Clique-Self-Assembly	225
<i>R. Rama, Suresh Badarla, and Kamala Krithivasan</i>	
Immune Systems Approaches for Cryptographic Algorithm	231
<i>Suriyani Ariffin, Ramlan Mahmud, Azmi Jaafar, and Muhammad Rezal Kamel Ariffin</i>	
DNA Computing in Microreactors: A Solution to the Minimum Vertex Cover Problem	236
<i>Xuncaizhang, Ying Niu, and Yanfeng Wang</i>	
DNA Tile Assembly Model for Bin Packing Problem	241
<i>Yanfeng Wang, Weili Lu, and Guangzhao Cui</i>	
An Extension of DNA Splicing System	246
<i>Yuhani Yusof, Nor Haniza Sarmin, T. Elizabeth Goode, Mazri Mahmud, and Fong Wan Heng</i>	
Implementation of Maximum Independent Set Problem by Algorithmic Tile Self-Assembly	249
<i>Zhen Cheng and Jianhua Xiao</i>	
Membrane Computing	
Segmentation of Peripheral Blood Smear Images Using Tissue-Like P Systems	257
<i>Feminna Sheeba, Robinson Thamburaj, Atulya K. Nagar, and Joy John Mammen</i>	
An Improved GPU Simulator for Spiking Neural P Systems	262
<i>Francis George C. Cabarle, Henry Adorna, and Miguel A. Martínez-del-Amor</i>	
Generation of Two Dimensional Arrays Using Parallel Insertion Scheme	268
<i>S. Hemalatha and S. Revathi</i>	
Hyperedge Replacement Graph P System	272
<i>Meena Parvathy Sankar, N.G. David, and D.G. Thomas</i>	

Comparing Membrane Computing with Ordinary Differential Equation in Modeling a Biological Process in Liver Cell	278
<i>Ravie Chandren Muniyandi and Abdullah Mohd. Zin</i>	
P Systems Generating Self Similar Tilings	284
<i>S. Jebasingh, T. Robinson, and Atulya K. Nagar</i>	
P Systems with 2D Picture Grammars	290
<i>Tao Song and Xiangxiang Zeng</i>	
Spiking Neural P Systems for Arithmetic Operations	296
<i>Xiangxiang Zeng, Tao Song, Linqiang Pan, and Xingyi Zhang</i>	
A Uniform Solution to Common Algorithmic Problem by Tissue P Systems with Cell Division	302
<i>Yunyun Niu, Linqiang Pan, and Mario J. Pérez-Jiménez</i>	

Complex Systems

The Novel Design for Global Stabilization of a Class of Complex Lower-Triangular Systems	309
<i>Bing Wang</i>	
Tuning of Auto-Disturbance Rejection Controller Based on the Invasive Weed Optimization	314
<i>Zhihua Chen, Shuo Wang, Zhonghua Deng, and Xuncaizhang</i>	
Hybrid Workflow Net Based Architecture for Modeling Huntington's Disease	319
<i>D. Neela and K. Rangarajan</i>	
Mathematical Modeling of a Complex System for MHD Flow in Hemodynamics	324
<i>D.S. Sankar, Nurul Aini Jaffar, Ahmad Izani Mohamed Ismail, and Atulya K. Nagar</i>	
A Study on Diminishing Cells Infinite Array	329
<i>N. Jansirani and V. Rajkumar Dare</i>	
Apical Growth Filamentous and Branching PC Grammar Systems	333
<i>J.D. Emerald</i>	
Application of Knowledge Discovery in Database to Blood Cell Counter Data to Improve Quality Control in Clinical Pathology	338
<i>D. Minnie and S. Srinivasan</i>	
Rule-Based and Example-Based Machine Translation from English to Arabic	343
<i>Mouiad Fadiel Alawneh and Tengku Mohd Sembok</i>	

Computational Neuroscience

Multi-class Support Vector Machine (SVM) Classifiers – An Application in Hypothyroid Detection and Classification	351
<i>Fereshteh Falah Chamasemani and Yashwant Prasad Singh</i>	
Abduction in Neuro Symbolic Integration	357
<i>Saratha Sathasivam</i>	
Author Index	362