

2012 UKSim 14th International Conference on Computer Modelling and Simulation

(UKSim 2012)

Cambridge, United Kingdom
28 – 30 March 2012



IEEE Catalog Number: CFP1289D-PRT
ISBN: 978-1-4673-1366-7

2012 14th International Conference on Modelling and Simulation

UKSim 2012

Table of Contents

Message from Chairs.....	xv
Conference Organization.....	xvi
International Program Committee.....	xvii
International Reviewers	xviii
Sponsors.....	xx
Keynotes.....	xxi

1 A: Neural Networks

Load Balancing of Nodes in Cloud Using Ant Colony Optimization	3
<i>Kumar Nishant, Pratik Sharma, Vishal Krishna, Chhavi Gupta, Kuwar Pratap Singh, Nitin, and Ravi Rastogi</i>	
A Reconfigurable, Generic and Programmable Feed Forward Neural Network Implementation in FPGA	9
<i>Ayman Youssef, Karim Mohammed, and Amin Nasar</i>	
Comparison of Different Artificial Neural Networks for Brain Tumour Classification via Magnetic Resonance Images	14
<i>Yawar Rehman and Fahad Azim</i>	
Applicability of Neural Networks to Software Security	19
<i>Adetunji Adebiyi, Johnnes Arreymbi, and Chris Imafidon</i>	
A Large Scale Digital Simulation of Spiking Neural Networks (SNN) on Fast SystemC Simulator	25
<i>Hamid Soleimani, Arash Ahmadi, Mohammad Bavandpour, A. Ali Amirsoleimani, and Mark Zwolinski</i>	

3 C: Evolutionary Computation

Ant Colony Optimization for Rule Induction with Simulated Annealing for Terms Selection	33
<i>Rizauddin Saian and Ku Ruhana Ku-Mahamud</i>	
On Untangled Meshes via Fruchterman Reingold Force Directed Graph Embedding	39
<i>Nitin</i>	
A New Genetic Folding Algorithm for Regression Problems	46
<i>Mohammad Mezher and Myasam F. Abbod</i>	
A Genetic Algorithm Approach for Solving Group Technology Problem with Process Plan Flexibility	52
<i>Sayedmohammadreza Vaghefinezhad and Kuan Yew Wong</i>	

5 E: Adaptive Dynamic Programming and Re-enforcement Learning

Modeling and Adaptive Control Simulation for a Distillation Column	61
<i>Vu Trieu Minh and John Pumwa</i>	
Intelligent Personalized Learning System Consideration	66
<i>Alex Pongpech</i>	

6 F: Bio-informatics and Bio-engineering

CFD Simulation of Blood Clot Behaviour Using GP Device	75
<i>Kuzilati Kushaari, Afzal Reza Ali Rahman, and Gillian Pearce</i>	
Bayesian Neural Network Applied in Medical Survival Analysis of Primary Biliary Cirrhosis	81
<i>Corneliu T.C. Arsene and Paulo J. Lisboa</i>	
Processing of Collision Data to Support Efficient Diagnosis of Concussion in Sports Athletes	86
<i>Dayananda Suratkal</i>	
Identification of Cardiac Ischemia Using Spectral Domain Analysis of Electrocardiogram	92
<i>Rama Valupadasu and B. Rama Rao Chunduri</i>	
Identification of Sudden Cardiac Arrest Using the Pan-Tompkins Algorithm	97
<i>V. Vijaya, K. Kishan Rao, and P. Sahrudai</i>	
Matrix Operations for the Simulation and Immediate Reverse-Engineering of Time Series Data	101
<i>Michael A. Idowu and James L. Bown</i>	

Evolved Topology Generalized Multi-layer Perceptron (GMLP) for Anatomical Joint Constraint Modelling	107
<i>Glenn L. Jenkins and Michael E. Dacey</i>	
Docking Study of Synthesized Juvenile Hormone Analogues as an Insect Growth Regulators	113
<i>Pamita Awasthi and Priyanka Sharma</i>	
Low Power Study on Trace Back and Reconstruction Modules for DNA Sequences Alignment Accelerator	117
<i>Abdul Karimi Halim, M.H. Harun, S. Mohamed, Z.A. Majid, M.A. Mansor, and S.A.M.A. Junid</i>	

7 G: Computational Finance and Economics

Simulation of Correlated Financial Defaults through Smoothed Cross-Entropy	129
<i>Giuseppe D'Acquisto, Loretta Mastroeni, and Maurizio Naldi</i>	
Heteroskedasticity Variance Index	135
<i>M. Hassan, M. Hossny, S. Nahavandi, and D. Creighton</i>	

8 H: Data and Semantic Mining

Effect of Feature Selection, SMOTE and under Sampling on Class Imbalance Classification	145
<i>Nadeem Qazi and Kamran Raza</i>	
Partition-Based Approach for Fast Mining of Transitional Patterns	151
<i>R.B.V. Subramanyam and Soma Raju Suvvari</i>	

9 I: Games, VR and Visualization

Creating Depth of Field Effects without Multiple Samples	159
<i>Richard Cant and Caroline Langensieoen</i>	
Feel3D: Free Viewpoint Video Recording Mechanism for Premeditated Scenarios, Using Pre-built Models	165
<i>Bhagya N. Wickramasinghe and Nihal D. Kodikara</i>	
User Perception of the Physical & Behavioral Realism of a Maritime Virtual Reality Environment	172
<i>Damitha Sandaruwan, Nihal Kodikara, Chamath Keppitiyagama, Rexy Rosa, Mahen Jayawardena, and Prabath Samarasinghe</i>	

11 K: Intelligent Systems and Applications

A Cognitive Model of Immune System for Increasing Security in Distributed Systems	181
<i>Elnaz B. Noeparast and Touraj Banirostam</i>	
Improving Settling and Rise Times of Controllers via Intelligent Algorithms	187
<i>Danilo Pelusi</i>	
Biomimetic Dexterous Hands: Human Like Multi-fingered Robotics Hand Control	193
<i>Ebrahim Mattar</i>	
Smart Solar Home System with Safety Device Low Voltage Alert	201
<i>Tawheed Hasan, Md. Faysal Nayan, Md. Asif Iqbal, and Monzurul Islam</i>	
An Intelligent Fault Monitoring and Risk Management Tool for Complex Critical Infrastructures: The SERSCIS Approach in Air-Traffic Surface Control	205
<i>D. Kostopoulos, G. Leventakis, Vasilis Tsoukas, and N. Nikitakos</i>	
Inherent Inter-vehicle Signaling Using Radio Frequency and Infra-red Communication	211
<i>Ahmedullah Aziz and Md. Shafayat Hossain</i>	
Applying SAQ-Learning Algorithm for Trading Agents in Bilateral Bargaining	216
<i>Saeed Jamali and Karim Faez</i>	
A Forensic Model for Forecasting Alerts Workload and Patterns of Intrusions	223
<i>Joshua Ojo Nehinbe and Johnson Ige Nehibe</i>	

12 L: Hybrid and Soft Computing

Malware Analysis with Multiple Features	231
<i>Muhammad Najmi Ahmad Zabidi, Mohd Aizaini Maarof, and Anazida Zainal</i>	
Optimisation of Classifier Ensemble for Predictive Toxicology Applications	236
<i>Mokhairi Makhtar, Longzhi Yang, Daniel Neagu, and Mick Ridley</i>	
ANFIS Based-Kinematic Modeling of Mobile Parallel Robot	242
<i>Amar Khoukhi, Mutaz Hamdan, and Fouad Al-Sunni</i>	

14 N: Control of Intelligent Systems and Control Intelligence

Design and Development of an Y4 Copter Control System	251
<i>Md. Shafayat Hossain, Ariyan M. Kabir, Pratyai Mazumder, Ahmedullah Aziz, Masudul Hassan, Md. Azizul Islam, and Pran Kanai Saha</i>	
Adaptive Control of an Intelligent Tank Using Fuzzy Logic	257
<i>Adnan I. Elberjaoui Yakzan, Atif Ali Khan, Evor L. Hines, and Daciana Iliescu</i>	

15 O: e-Science and e-Systems

A Quantitative Evaluation Method of Landmark Effectiveness for Pedestrian Navigation	265
<i>Hiroshi Furukawa and Hiroto Uto</i>	

16 P: Robotics, Cybernetics, Engineering, Manufacturing and Control

Opportunities and Constraints of Virtual Reality Application in International and Domestic Car Companies of Malaysia	273
<i>Maryam Mousavi, Faieza Abdul Aziz, and Napsiah Ismail</i>	
Prediction of the Effect of Heat Generation in Ballscrew on the Accuracy of CNC Milling Machine	278
<i>Hojat Dehnavi, Mohammad Reza Movahhedy, Ahmad Naebi, and Soleyman Pasban</i>	
Image Query Based Search Engine Using Image Content Retrieval	283
<i>Divya Venkata Ragatha and Divakar Yadav</i>	
Amorphous Silicon(a-Si:H) Thin Film Based Omnidirectional Control Solar Powered Vehicle	287
<i>Abdullah Moinuddin, Md. Jahidul Hoque, Jony C. Sarker, and Akhter Zia</i>	
Active Stereo Vision for Mobile Robot Localization and Mapping Path Planning	293
<i>Khalid Al Mutib, M. Al Sulaiman, Hedjar Ramdane, M. M. Emaduddin, and Ebrahim A. Mattar</i>	
Development of Dynamics and Control Simulator for Mobile CT Device and Its Implementation	300
<i>Duckjune Kim, Sang-Hoon Ji, and Kwang-Hee Lee</i>	
A Neuro-fuzzy Model of the Inverse Kinematics of a 4 DOF Robotic Arm	306
<i>Elizabeta Lazarevska</i>	

17 Q: Methodologies, Tools and Operations Research

Decision Support System for Water Distribution Systems Based on Neural Networks and Graphs	315
<i>Corneliu Arsene, David Al-Dabass, and Johanna Hartley</i>	
Comparison Based Group Ranking Outcome for Multiattribute Group Decisions	324
<i>Subrata Chakraborty and Chung-Hsing Yeh</i>	
A Novel Algorithm for Linear Programming	328
<i>Kumar Eswaran</i>	

Saber Model Automatic Translation Tool for Aeronautical Simulations	334
<i>Beniamino Guida and Alberto Cavallo</i>	
Modelica Models Translation into Java Components for Optimization and DAE	
Solving Using Automatic Differentiation	340
<i>Franck Verdière, Abir Rezgui, Sana Gaaloul, Benoit Delinchant, Laurent Gerbaud, Frédéric Wurtz, and Xavier Brunotte</i>	
Traffic Simulation Framework	345
<i>Paweł Gora</i>	

18 R: Discrete Event and Real Time Systems

Development of Coal Mechanical Preparation in Light of Platform Independent Modeling: Two Solutions	353
<i>Bob Arnold and M. Reza Shadnam</i>	
Simulating Bed Capacity: Evaluating the Impact of Healthcare Service Transfers	358
<i>Robert Bareš, Jeff Griffiths, Vincent Knight, Janet Williams, Kesh Baboolal, and Andrew Nelson</i>	

19 S: Image, Speech and Signal Processing

Minimizing Vertices in 3D Lips Model Using Relevance Measure	365
<i>Siti Salwa Salleh</i>	
Enhancement of the Low Contrast Image Using Fuzzy Set Theory	371
<i>Khairunnisa Hasikin and Nor Ashidi Mat Isa</i>	
Complexity Measure as a Feature to Classify Schizophrenic and Healthy Participants	377
<i>S.D. Katebi and M. Sabeti</i>	
A New Approach for Object Boundary Detection and Identification	383
<i>Lochana Prematunge and Anuja Dharmaratne</i>	
Wolof Speech Recognition Model of Digits and Limited-Vocabulary Based on HMM and ToolKit	389
<i>James K. Tamgno, Etienne Barnard, Claude Lishou, and Morgan Richomme</i>	
Efficient Implementation of AES Algorithm Immune to DPA Attack	396
<i>A. Amaar, I. Ashour, and Mustafa Shipre</i>	
Modeling Pushbroom Scanning Systems	402
<i>Srinivas Koduri</i>	
An Evaluation Mechanism for Saliency Functions Used in Localized Image Fusion Quality Metrics	407
<i>M. Hossny, S. Nahavandi, and D. Creighton</i>	

Simulation of DPCM and ADM Systems	416
<i>Christopher Mansour, Roger Achkar, and Gaby Abou Haidar</i>	
Multisensor Data Fusion with Singular Value Decomposition	422
<i>Srinivas Koduri</i>	
Formant Analysis and Mathematical Model of Kazakh Vowels	427
<i>Zhandos Yessenbayev, Muslima Karabalayeva, and Altynbek Sharipbayev</i>	
Automated P.falciparum Detection System for Post-Treatment Malaria	
Diagnosis Using Modified Annular Ring Ratio Method	432
<i>S. Kareem, I. Kale, and R.C.S. Morling</i>	
Image Matching CAPTCHAs	437
<i>Hassan Hajjdiab and Ashraf Khalil</i>	

20 T: Industry, Business, Management, Human Factors and Social Issues

A Chaos Algorithm from Service-Oriented Business System Modeling	445
<i>Tomonobu Sato</i>	

21 U: Energy, Power, Transport, Logistics, Harbour, Shipping and Marine Simulation

Scatter and Doppler Effect of Wind Power Plants to Land Radars	453
<i>Derya Sozen and Mesut Kartal</i>	
Comparison of SOC Estimation Performance with Different Training Functions	
Using Neural Network	459
<i>Wei Jian, Xuehuan Jiang, Jinliang Zhang, Zhengtao Xiang, and Yubing Jian</i>	
Analysis and Comparison of Multi-level Inverters Based on Two-Level Space	
Vector PWM	464
<i>Masoud Soleimanipour, Hamed Sadeghi Goughari, and Nader Sargolzaei</i>	
Discrete Event Simulation Enabled High Level Emulation of a Distribution	
Centre	470
<i>James Zhang, Vu Le, Michael Johnston, Saeid Nahavandi, and Doug Creighton</i>	
Frequency Survey Simulation for Developing Novel Radio Frequency Energy	
Harvesting Model	476
<i>Hossam Elanzeery and Rafik Guindi</i>	
Distributed Event-Driven Simulation Environment for PRIME Based Metering	
Networks Planning	480
<i>A. Sanz, P.J. Piñero, D. Montoro, and J.I. Garcia</i>	
Identification of Key Energy Harvesting Parameters through Monte Carlo	
Simulations	486
<i>James Docherty, Alex Bystrov, and Alex Yakovlev</i>	

Energy and LCC Optimised Design of Compressed Air Systems: A Mixed Integer Optimisation Approach with General Applicability	491
<i>Håkan Fridén, Linus Bergfors, Anders Björk, and Ebrahim Mazharsolook</i>	

22 V: Parallel, Distributed and Software Architectures and Systems

Evaluating Qlogic's Dispersive Routing on High Performance Clusters	499
<i>Sadiq M. Sait and Raed Al-Shaikh</i>	
A New Fault Tolerant Routing Algorithm for Advance Irregular Augmented Shuffle Exchange Network	505
<i>Ved Prakash Bhardwaj and Nitin</i>	
Optimal Method for Migration of Tasks with Duplication	510
<i>Rashmi Sharma and Nitin</i>	
Decentralized Computation and Communication Intensive Task Scheduling Algorithm for P2P Grid	516
<i>Piyush Chauhan and Nitin</i>	
Cloud Management Simulation and Design	522
<i>Kumar Saurabh and Rishi Ranjan</i>	
Proposal for Parallel Computer Architecture of a Cellular Type Aimed at Development of an Autonomous Learning Machine	528
<i>Neven Dragojlovic</i>	
Protection of Integrity and Ownership of PDF Documents Using Invisible Signature	533
<i>Imad Fakhri Al Shaikhli, Akram M. Zeki, Rusydi H. Makarim, and Al-Sakib Khan Pathan</i>	
Towards Service Oriented Architecture (SOA) for Massive Multiplayer Online Games (MMOG)	538
<i>Farrukh Arslan</i>	

23 W: Internet Modelling, Semantic Web and Ontologies

Security Analysis and Implementation of 3-Level Security System Using Image Based Authentication	547
<i>Surabhi Anand, Priya Jain, Nitin, and Ravi Rastogi</i>	
Flame Detector Model: A Prototype for Detecting Flames in Social Networking Sites	553
<i>Shiv Shankar Prasad Shukla, Nitin, Sandeep Pratap Singh, Navjot Singh Parande, Ankit Khare, and Nilesh Kumar Pandey</i>	

24 X: Mobile/Ad Hoc Wireless Networks, Mobicast, Sensor Placement, Target Tracking

Sensitivity of DSR Protocol Performance to Propagation Loss Models at Higher Microwave Frequencies	561
<i>Lawal Bello, Kwashie A. Anang, Panos Bakalis, Predrag B. Rpajic, and Titus I. Eneh</i>	
Open Mobile Gateway O.M.G. for Accessing Enterprise Applications	566
<i>P.M. Agarwal and V. Mittal</i>	
Path Loss Effect on Energy Consumption in a WSN	569
<i>Krishna Doddapaneni, Enver Ever, Orhan Gemikonakli, Ivano Malavolta, Leonardo Mostarda, and Henry Muccini</i>	
Cooperative Synchronization in Wireless Multi-hop Communication	575
<i>Hongmin Deng, Yong Zhi, and Hui Hu</i>	
Simulation Environment for Autonomic Cooperative Networking in Indoor Scenario	580
<i>Michał Wódczak</i>	
Near Field Communication - Research, Teachings and Training	586
<i>Juergen Sieck and Volodymyr Brovkov</i>	
ADEUS: Tool for Rapid Acceleration of Network Simulation in OMNeT++	591
<i>Peter Vilhan and Jan Gajdos</i>	
Performance of Multicast Algorithms over Coded Packet Wireless Networks	596
<i>Adeyemi Abel Ajibesin, Neco Ventura, H. Anthony Chan, Alexandru Murgu, and O.K. Egunsola</i>	

25 Y: Performance Engineering of Computer & Communication Systems

Modeling of Acoustic Channel for Underwater Wireless Communication System in AUV Application	603
<i>Hou P. Yoong, Kiam B. Yeo, Kenneth T.K. Teo, and Wong L. Wong</i>	
Interference Cancellation Using Iterative Equalization for Communication Networks	608
<i>Grace Oletu, Predrag Rapajic, Kwashie Anang, and Ruiheng Wu</i>	
Performance Evaluation of a Non-exhaustive Polling System with Asymmetrical Finite Queues	613
<i>Adnan Sohail</i>	
CLASS - A Cross Layer Algorithm for Smoothed Switchover in Multi-homed Body Sensor Networks	618
<i>Sadik Armagan, Enda Fallon, Yuansong Qiao, and Brian Lee</i>	

Virtual Network Simulator Architecture	624
<i>Isil Burcu Barla, Dominic Axel Schupke, and Georg Carle</i>	
Index Tuning through Query Evaluation Mechanism Based on Indirect Domain Knowledge	630
<i>Sreekumar Vobugari, D.V.L.N. Somayajulu, and B.M. Subraya</i>	
Performance Analysis of Bandwidth Request Mechanism of rtPS and nrtPS in WiMAX Uplink Traffic	636
<i>Adnan Sohail</i>	
26 Z: Circuits, Sensors and Devices	
Performance Analysis of Dynamic Threshold-Voltage CNTFET for High-Speed Multi-level Voltage Detector	643
<i>Syed Mustafa Khelat Bari, Subrata Biswas, A.K.M. Arifuzzman, Habib Muhammad Nazir Ahmad, and Nawjif Md. Anamul Hasan</i>	
High Speed Modified Booth Encoder Multiplier for Signed and Unsigned Numbers	649
<i>Ravindra P. Rajput and M.N. Shanmukha Swamy</i>	
Latch-Controlled Current Cell for Low Power Current-Steering D/A Converter	655
<i>Chan-Soo Lee, Jung-Woong Park, Hyung-Gyoo Lee, Nam-Soo Kim, and Hai-Feng Jin</i>	
Simulation of Enhanced Gate Control in a Double Gate Quantum Domain InAlAs/InGaAs/InP HEMT	660
<i>Neha Verma, Jyotika Jogi, Mridula Gupta, and R.S. Gupta</i>	
Design and Performance Analysis of Ultra Fast CNFET Comparator and CMOS Implementation Comparison	665
<i>Syed Mustafa Khelat Bari, Nur-e-elahi Shonchoy, Farah Tasnuba Kabir, and Arif Khan</i>	
A Novel Design and Simulation of a Compact and Ultra Fast CNTFET Multi-valued Inverter Using HSPICE	671
<i>Subrata Biswas, Kazi Muhammad Jameel, Rahmanul Haque, and Md. Abul Hayat</i>	
Effects of Diameter of P-channel Nanowire Transistors on Nanowire-CMOS Inverter Characteristics	678
<i>Yasir Hashim and Othman Sidek</i>	
Author Index	682