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Jing Sun¹, Dunwei Gong², Zhuang Miao², Zhigang Xu³ and Heng Zhang³
¹*School of Sciences, HuaiHai Institute of Technology, Lianyungang, China;*
²*School of Information and Electrical Engineering, China University of Mining and Technology, Xuzhou, China;* ³*School of Sciences, Huaihai Institute of Technology, Lianyungang, China*
- 3:10PM** **E-16729** **Dynamic Optimization with Restricted and Unrestricted Moves Between Changes: A Study on the Dynamic Maximal Covering Location Problem 570**
Jenny Fajardo Calderin¹, Antonio D. Masegosa² and David A. Pelta³
¹*Department of Artificial Intelligence and Infrastructure and Systems, Polytech. Higher Inst., José A. Echeverría, Cuba;* ²*Deusto Institute of Technology, University of Deusto, 48007, Bilbao, Spain and IKERBASQUE, Basque Foundation for Science, 48011, Bilbao, Spain;* ³*Department of Computer Science and AI, University of Granada, Granada, Spain.*
- 3:30PM** **E-16435** **A Radius-Free Quantum Particle Swarm Optimization Technique for Dynamic Optimization Problems 578**
Kyle Robert Harrison¹, Beatrice M. Ombuki-Berman² and Andries P. Engelbrecht¹
¹*Department of Computer Science, University of Pretoria, Pretoria, South Africa;* ²*Department of Computer Science, Brock University, St. Catharines, ON, Canada.*
- 3:50PM** **E-16690** **Competitive Coevolutionary Algorithm for Robust Multi-Objective Optimization: The Worst Case Minimization 586**
Ivan Reinaldo Meneghini¹, Frederico Gadelha Guimarães² and Antonio Gaspar-Cunha³
¹*Graduate Program in Electrical Engineering, Federal University of Minas Gerais, Av. Antônio Carlos 6627, 31270-901, Belo Horizonte, MG, Brazil;*
²*Departament of Electrical Engineering, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil;* ³*Institute for Polymers and Composites, University of Minho, Campus de Azurém 4800-058 Guimarães, Portugal.*
- 4:10PM** **E-16701** **Orthogonal Learning Particle Swarm Optimization with Variable Relocation for Dynamic Optimization 594**
Zi-Jia Wang, Zhi-Hui Zhan, Ke-Jing Du, Zhi-Wen Yu and Jun Zhang
School of Computer Science and Engineering, South China University of Technology, 510006 Guangzhou, P.R. China.

Session MM-18	Recent Advances in CI: Best Regular Paper Competition
Date/Time	Monday, 25 July 2016 / 2:30PM – 4:30PM
Venue	Room 208+209
Chair	Oscar Cerdón García

- 2:30PM** **E-16556** **A Multi-phase Multiobjective Approach Based on Decomposition for Sparse Reconstruction** 601
Hui Li¹, Yuanyuan Fan¹, Qingfu Zhang², Zongben Xu¹ and Jingda Deng²
¹*School of Mathematics and Statistics, Xi'an Jiaotong University, Xi'an, Shaanxi, China;* ²*Department of Computer Science, City University of Hong Kong, Kowloon Tong, HongKong.*
- 2:50PM** **E-16173** **Analyzing Coevolutionary Games with Dynamic Fitness Landscapes** 609
Hendrik Richter
HTWK Leipzig University of Applied Sciences, Faculty of Electrical Engineering and Information Technology, Postfach 301166, D-04251 Leipzig, Germany.
- 3:10PM** **F-16425** **On the Satisfaction of Moser-Navara Axioms for Fuzzy Inference Systems** N/A
Martin Štěpnička
Institute for Research and Applications of Fuzzy Modeling, Centre of Excellence IT4Innovations, Division University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic
- 3:30PM** **F-16143** **A Similarity-based Inference Engine for Non-Singleton Fuzzy Logic Systems** N/A
Christian Wagner, Amir Pourabdollah, Josie McCulloch, Robert John and Jonathan M. Garibaldi
Lab for Uncertainty in Data and Decision Making (LUCID), School of Computer Science, University of Nottingham, Nottingham, NG8 1BB, UK
- 3:50PM** **N-16838** **Adaptive Learning of Dynamic Movement Primitives through Demonstration** N/A
Raj Samant, Laxmidhar Behera and Gaurav Pandey
Department of Electrical Engineering, Indian Institute of Technology, Kanpur, India - 208016
- 4:10PM** **N-16020** **Complex-Valued B-Spline Neural Network and its Application to Iterative Frequency-Domain Decision Feedback Equalization for Hammerstein Communication Systems** N/A
Sheng Chen¹, Xia Hong², Emad Khalaf³, Fuad E. Alsaadi³ and Chris J. Harris¹
¹*Electronics and Computer Science, University of Southampton, Southampton SO17 1BJ, UK. S. Chen is also with King Abdulaziz University, Jeddah 21589, Saudi Arabia;* ²*(x.hong@reading.ac.uk) is with School of Systems Engineering, University of Reading, Reading RG6 6AY, UK;* ³*Electrical and Computer Engineering, Department, Faculty of Engineering, King Abdulaziz University, Jeddah, 21589, Saudi Arabia.*

Session MP-12	SS CDCI-05B: Computational Intelligence and Games / SS CDCI-08: Computational Intelligence Techniques for the Analysis of Big and Streaming Data in Complex Systems
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 202
Chair	Diego Perez Liebana / Barbara Hammer

- 4:30PM E-16445 Learning a Multi-Player Chess Game with TreeStrap 617**
 Diogo Real and Alan Blair
School of Computer Science and Engineering, University of New South Wales, Sydney, 2052, Australia.
- 4:50PM E-17165 Multi-Objective Tree Search Approaches for General Video Game Playing 624**
 Diego Perez-Liebana¹, Sanaz Mostaghim² and Simon M. Lucas¹
¹*School of Computer Science and Electronic Engineering, University of Essex, UK;* ²*Faculty of Computer Science, Otto von Guericke University, Magdeburg, Germany.*
- 5:10PM E-26040 A Myopic Monte Carlo Strategy for the Partially Observable Travelling Salesman Problem 632**
 Andrew R. Buck and James M. Keller
Department of Electrical and Computer Engineering, University of Missouri, Columbia, Missouri, USA
- 5:30PM E-16712 Evolutionary Undersampling for Extremely Imbalanced Big Data Classification under Apache Spark 640**
 I. Triguero¹, M. Galar³, D. Merino², J. Maillou², H. Bustince² and F. Herrera²
¹*Department of Internal Medicine of the Ghent, University, 9052 Zwijnaarde, Belgium;* ²*Department of Computer, Science and Artificial Intelligence of the University of Granada, CITICUGR, Granada, 18071, Spain;* ³*Department of Automatics and Computation, Universidad Pública de Navarra, Campus Arrosadía s/n, 31006, Pamplona, Spain.*
- 5:50PM E-17078 A Scalable Complex Event Analytical System with Incremental Episode Mining over Data Streams 648**
 Jerry C. C. Tseng¹, Jia-Yuan Gu¹, P. F. Wang², Ching-Yu Chen², Chu-Feng Li² and Vincent S. Tseng³
¹*Department of Computer Science and Information Engineering, National Cheng Kung University, Tainan City, Taiwan, R.O.C;* ²*Institute for Information Industry, Taipei City, Taiwan, R.O.C;* ³*Department of Computer Science, National Chiao Tung University, Hsinchu City, Taiwan, R.O.C.*

- 6:10PM E-16791 Predicting Recurrence in Clear Cell Renal Cell Carcinoma — Analysis of TCGA data using Outlier Analysis and Generalized Matrix LVQ 656**
 Gargi Mukherjee¹, Gyan Bhanot^{1,2,3}, Kevin Raines⁴, Srikanth Sastry⁵, Sebastian Doniach⁴ and Michael Biehl⁶
¹Rutgers University, Department of Molecular Biology and Biochemistry, Piscataway, NJ 08854, USA; ²Rutgers Cancer Institute of New Jersey, 195 Little Albany Street, New Brunswick, NJ 08903, USA; ³Rutgers University, Department of Physics, Piscataway, NJ 08854, USA; ⁴Stanford University, Department of Physics, Stanford, CA, 94305, USA; ⁵Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, 560064, India; ⁶University of Groningen, Johann Bernoulli Institute for Mathematics and Computer Science, Univ. of Groningen, P.O. Box 407, 9700AK Groningen, The Netherlands.

Session MP-13	SS CEC-22: Evolutionary Robotics
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 203
Chair	Patricia A. Vargas / Rahul Kala

- 4:30PM E-16448 Sampling based Mission Planning for Multiple Robots 662**
 Rahul Kala
Robotics and Artificial Intelligence Laboratory, Indian Institute of Information Technology, Allahabad, Deoghat, Jhalwa, Allahabad, India.
- 4:50PM E-16724 Multi-objective Topology and Weight Evolution of Neuro-controllers 670**
 Omer Abramovich and Amiram Moshaiov
Iby and Aladar Fleischman Faculty of Engineering, Tel-Aviv University, Israel.
- 5:10PM E-16739 A Novel Efficient Task-Assign Route Planning Method for AUV Guidance in a Dynamic Cluttered Environment 678**
 S. MahmoudZadeh, D. M. W. Powers and A. M. Yazdani
School of Computer Science, Engineering and Mathematics, Flinders University, Adelaide, SA 5042, Australia.
- 5:30PM E-16411 Noise-Resistant Particle Swarm Optimization for the Learning of Robust Obstacle Avoidance Controllers using a Depth Camera 685**
 Iñaki Navarro, Ezequiel Di Mario and Alcherio Martinoli
Distributed Intelligent Systems and Algorithms Laboratory, School of Architecture, Civil and Environmental Engineering, École Polytechnique Fédérale de Lausanne, Switzerland.
- 5:50PM E-16707 Effects of Model Parameter Interactions on Naïve Creatures' Success of Learning to Cross a Highway 693**
 Anna T. Lawniczak¹, Leslie Ly¹, Fei Yul^{1,3} and Shengkun Xie²
¹Department of Mathematics and Statistics, University of Guelph, Guelph, ON N1G 2W1, Canada; ²Ted Rogers School of Management, Ryerson University, Toronto, ON M5B 2K3, Canada.

6:10PM **E-16307** **An Empirical Study of the Co-Evolution of Utility and Predictive Ability** 703
 Kevin B. Korb, Lachlan Brumley and Carlo Kopp
Clayton School of Information Technology, Monash University, Clayton, Victoria, Australia.

Session MP-14	Multiobjective Optimization
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 204
Chair	Matthew Curtis / Amin Ibrahim

4:30PM **E-16230** **The Effect of Bias on Particle Behaviour for MOPSO** 711
 Mathew Curtis and Andrew Lewis
School of Information and Communication Technology, Griffith University, Brisbane, Australia.

4:50PM **E-16871** **Balancing Risk and Expected Gain in Kriging-based Global Optimization** 719
 Hao Wang, Michael Emmerich and Thomas Bäck
Leiden Institute of Advanced, Computer Science, Leiden University, Niels Bohrweg 1, 2333 CA, Leiden, The Netherlands.

5:10PM **E-16503** **A Novel Bi-objective Model with Particle Swarm Optimizer for Structural Balance Analytics in Social Networks** 728
 Jianan Yan¹, Shasha Ruan¹, Qing Cai¹, Jiao Shi², Zhao Wang¹ and Maoguo Gong¹
¹*Key Laboratory of Intelligent Perception and Image Understanding, Xidian University, Xi'an, China;* ²*School of Electronics and Information, Northwestern Polytechnical University, Xi'an, China.*

5:30PM **E-16920** **3D-RadVis: Visualization of Pareto Front in Many-Objective Optimization** 736
 Amin Ibrahim¹, Shahryar Rahnamayan¹, Miguel Vargas Martin² and Kalyanmoy Deb³
¹*Faculty of Electrical, Computer, and Software Engineering, University of Ontario Institute of Technology, Oshawa, Canada;* ²*Faculty of Business and Information Technology, University of Ontario Institute of Technology, Oshawa, Canada;* ³*Faculty of Electrical, Computer, and Computer Engineering, Michigan State University, East Lansing, Michigan, USA.*

5:50PM **E-17019** **Application of NSGA-II framework to the Travel Planning Problem using real-world travel data** 746
 Breno Alves Beirigo and André Gustavo dos Santos
Departamento de Informática, UFV — Universidade Federal de Viçosa, Viçosa — MG, Brazil.

6:10PM **E-16749** **Multi-objective Model to Address Planning in a RTS Game** 754
 Caio Freitas de Oliveira, Elizabeth Ferreira Gouvêa Goldberg and Marco César Goldberg
Department of Informatics and Applied Mathematics, Federal University of Rio Grande do Norte, Natal, Brazil.

Session MP-15	SS CEC-24: Evolutionary Computation in Operations Research, Management Science and Decision Making
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 205
Chair	Wei-Chang Yeh / Xingxing Hao

- 4:30PM E-26026 Application of Route Flexibility in Data-Starved Vehicle Routing Problem with Time Windows 799**
Chen Kim Heng¹, Quoc Chinh Nguyen¹, Siwei Jiang¹, Puay Siew Tan¹, Abhishek Gupta², Bingshui Da² and Yew Soon Ong²
¹Planning and Operations Management, Singapore Institute of Manufacturing Technology, Singapore; ²School of Computer Engineering, Nanyang Technological University, Singapore.
- 4:50PM E-16297 Decision Support for Cooperative Carriers based on Clustering Requests and Discrete Particle Swarm Optimization 762**
Fu-Shiung Hsieh and Hao Wei Huang
Department of Computer Science and Information Engineering, Chaoyang University of Technology, Taichung, Taiwan.
- 5:10PM E-16476 Improving The Efficiency of PSOVina for Protein-Ligand Docking By Two-Stage Local Search 770**
Hio Kuan Tai, Hang Lin and Shirley W. I. Siu
Department of Computer and Information Science, Faculty of Science and Technology, University of Macau, Macau, China.
- 5:30PM E-16160 Simplified Swarm Optimization with Modular Search for the General Multi-level Redundancy Allocation Problem in Series-parallel Systems 778**
Wei-Chang Yeh¹, Cyuan-Yu Luo¹, Chyh-Ming Lai¹, Chi-Ting Hsu¹, Yuk Ying Chung² and Jsen-Shung Lin³
¹Department of IEEM, National Tsing Hua University, Hsinchu, Taiwan; ²School of Information Technology, University of Sydney, NSW, Australia; ³Department of Information, Management Central Police University, Taoyuan, Taiwan
- 5:50PM E-16498 Emergency Logistics Scheduling in Disaster Relief based on a Multi-agent Genetic Algorithm 785**
Xiaohui Gan, Jing Liu and Xingxing Hao
Key Laboratory of Intelligent, Perception and Image Understanding of Ministry of Education, Xidian University, Xi'an, 710071, China.
- 6:10PM E-16741 A MOEA/D based Approach for Hospital Department Layout Design 793**
Yanmei Ma¹, Xingquan Zuo¹, Xuwen Huang², Fulai Gu³, Chunlu Wang¹ and Xinchao Zhao⁴
¹School of Computer Science, Beijing University of Posts and Telecommunications, Beijing, 100876, China; ²Faculty of Management and Economics, Dalian University of Technology, Dalian, 116024, China; ³Department of Business Management, Dalian University of Technology, Dalian, 116024, China; ⁴School of Science, Beijing University of Posts and Telecommunications, Beijing, 100876, China

Session MP-16	SS CEC-28B: Complex Networks and Evolutionary Computation / SS CEC-35 Parallel and Distributed Evolutionary Computation in the Inter-Cloud Era
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 206
Chair	Masaharu Munetomo / Keiko Ono

- 4:30PM E-16207 On the use of Immune Clone Optimization for Unconstrained Multi-Objective Resource Allocation in the Cognitive OFDMA Networks 806**
Ronghua Shang, Weitong Zhang, Ailing Wen, Kun Zhang and Licheng Jiao
Key Laboratory of Intelligent Perception and Image, Understanding of Ministry of Education, Xidian University, Xi'an, 710071, China.
- 4:50PM E-16977 evoVersion: Visualizing Evolutionary Histories 814**
Justin Kelly and Christian Jacob
Department of Computer Science, University of Calgary, Calgary, Canada.
- 5:10PM E-16342 Parallel Differential Evolution Approach for Cloud Workflow Placements Under Simultaneous Optimization of Multiple Objectives 822**
Daniel Balouek-Thomert^{1,2}, Arya K. Bhattacharya³, Eddy Caron², Karunakar Gadireddy³ and Laurent Lefevre²
¹NewGeneration-SR, Paris, France; ²INRIA Avalon team, LIP Laboratory, UMR CNRS — ENS de Lyon — INRIA — UCB Lyon 5668 University of Lyon, France; ³School of Engineering, Mahindra Ecole Centrale, Hyderabad, India
- 5:30PM E-16563 Numerical Assessment of the Parallelization Scalability on 200 MINLP Benchmarks 830**
Martin Schlueter and Masaharu Munetomo
Information Initiative Center, Hokkaido University Sapporo, Sapporo 060-0811, Japan.
- 5:50PM E-16480 Distributed Light Brightness Control based on cuSASGP 838**
Keiko Ono¹ and Yoshiko Hanada²
¹Department of Electronics and Informatics, Ryukoku University, Japan; ²Faculty of Engineering Science, Kansai University, Japan.
- 6:10PM E-16566 Development of a Multi-player Interactive Genetic Algorithm-based 3D Modeling System for Glasses 846**
Takahito Seyama¹ and Masaharu Munetomo²
¹Graduate School of Information Science and Technology, Hokkaido University, Sapporo 060-0811, Japan; ²Information Initiative Center, Hokkaido University, Sapporo 060-0811, Japan.

Session MP-17	SS CEC-27B: Evolutionary Computation in Dynamic and Uncertain Environments / SS CEC-10: Computational Intelligence in Aerospace Science and Engineering
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 207
Chair	Michalis Mavrovouniotis / Massimiliano Vasile

- 4:30PM E-16469 Empirical Study on the Effect of Population Size on MAX-MIN Ant System in Dynamic Environments 853**
 Michalis Mavrovouniotis and Shengxiang Yang
Centre for Computational Intelligence (CCI), School of Computer Science and Informatics, De Montfort University, The Gateway, Leicester, LE1 9BH, UK.
- 4:50PM E-16703 A Synthesized Ranking-assisted NSGA-II for Interval Multi-objective Optimization 861**
 Pengfei Zhang¹, Ruidong Xu¹, Xiaoyan Sun¹, Dunwei Gong¹, Yong Zhang¹ and Jong Choi²
¹*School of Information and Electrical Engineering, China University of Mining & Technology, Jiangsu Xuzhou, 221008, P.R. China;* ²*Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN, 37831, USA.*
- 5:10PM E-16925 Global Solution of Multi-objective Optimal Control Problems with Multi Agent Collaborative Search and Direct Finite Elements Transcription 869**
 Lorenzo A. Ricciardi, Massimiliano Vasile and Christie Maddock
Department of Mechanical and Aerospace Engineering, University of Strathclyde, Glasgow, Scotland.
- 5:30PM E-16511 Packing Programming of Space Station Spacewalk Events Based on Bin Packing Theory and Differential Evolution Algorithm 877**
 Yuehe Zhu, Yazhong Luo and Jin Zhang
College of Aerospace Science and Engineering, National University of Defense Technology, Changsha, 410073, China
- 5:50PM E-16810 Towards Uncertainty Quantification and Management in Multi-Disciplinary Design Optimisation 885**
 J. Loxham, T. Kipouros and A. M. Savill
School of Aerospace, Transport and Manufacturing, Cranfield University, MK43 0AL, Bedfordshire, United Kingdom.
- 6:10PM E-16976 Time-Series Optimization Methodology and Knowledge Discovery of Descend Trajectory for Civil Aircraft 893**
 Masahiro Kanazaki and Norazila Binti Othman
Graduate School of System Design, Tokyo Metropolitan University, Hino, Tokyo, 191-0065, Japan

Session MP-18	Recent Advances in CI: Best Student Paper Competition
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 208+209
Chair	Yew Soon Ong

4:30PM	E-17092	Evolvability as a Quality Criterion for Linear Deformation Representations in Evolutionary Optimization 901 Andreas Richter ¹ , Jascha Achenbach ¹ , Stefan Menzel ² and Mario Botsch ¹ ¹ <i>Computer Graphics Group, Bielefeld University, Germany;</i> ² <i>Honda Research Institute Europe, Germany</i>
4:50PM	E-16367	Social-Insect-Inspired Adaptive Task Allocation for Many-Core Systems 911 Matthew Rowlings, Andy M. Tyrrell and Martin A. Trefzer <i>Intelligent Systems Group, Department of Electronics, University of York, York, YO31 5DD, UK.</i>
5:10PM	F-16508	An Analytical Approach for Solving Type-1 and Type-2 Fully Fuzzy Linear Systems of Equations N/A Sheriff Sadiqbacha and Saeed Jafarzadeh <i>Computer & Electrical Engineering, California State University Bakersfield, United States</i>
5:30PM	F-16137	Measuring the Similarity between zSlices General Type-2 Fuzzy Sets with Non-Normal Secondary Membership Functions N/A Josie McCulloch and Christian Wagner <i>Lab for Uncertainty in Data and Decision Making (LUCID) and Horizon, School of Computer Science, University of Nottingham, Nottingham, NG8 1BB, UK</i>
5:50PM	N-16573	Spin Torque Nano-Oscillator based Oscillatory Neural Network N/A Chamika M. Liyanagedera ¹ , Karthik Yogendra ¹ , Kaushik Roy ¹ and Deliang Fan ² ¹ <i>School of Electrical & Computer Engineering, Purdue University;</i> ² <i>School of Electrical and Computer Engineering, University of Central Florida, USA</i>
6:10PM	N-16558	Detection of False Data Attacks in Smart Grid with Supervised Learning N/A Jun Yan, Bo Tang and Haibo He <i>Department of Electrical, Computer, and Biomedical Engineering, University of Rhode Island, Kingston, Rhode Island 02881, USA</i>

Session TA-12	Genetic Algorithms
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 202
Chair	Zahid Islam / Ronghua Shang

- 8:00AM E-16660 The Importance of Diversity in the Application of Evolutionary Algorithms to the Sudoku Problem 919**
Carlos Segura, S. Ivvan Valdez Peña, Salvador Botello Rionda and Arturo Hernández Aguirre
Centro de Investigación en Matemáticas, A.C. (CIMAT), Área de Computación, Jalisco S/N, Col. Valenciana, Guanajuato, 36023, México.
- 8:20AM E-16955 A Genetic Algorithm for a Workforce Scheduling and Routing Problem 927**
Haneen Algethami, Rodrigo Lankaites Pinheiro and Dario Landa-Silva
School of Computer Science, ASAP Research Group, The University of Nottingham, United Kingdom.
- 8:40AM E-17075 A Genetic Algorithm with a Mutation Mechanism based on a Gaussian and Uniform Distribution to Minimize Addition Chains for Small Exponents 935**
Eduardo Vázquez-Fernández¹, Carlos Cadena² and David Reyes-Gomez²
¹*Instituto Politécnico Nacional, ESIME Culhuacán, Carrera de Ingeniería en Computación, Av. Santa Ana No. 1000, Col. San Francisco Culhuacán, México D.F. 04430, México;* ²*Instituto Politécnico Nacional, ESIME Culhuacán, SEPI – ESITI, Av. Santa Ana No. 1000, Col. San Francisco Culhuacán, México D.F. 04430, México.*
- 9:00AM E-16211 An intuitionistic fuzzy possibilistic C-means clustering based on genetic algorithm 941**
Ronghua Shang, Tian Pingping, Wen Ailing, Wenzhan Liu and Licheng Jiao
Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, Xi'an, 710071, China
- 9:20AM E-16896 A Novel Genetic Algorithm-Based Clustering Technique and its Suitability for Knowledge Discovery from a Brain Dataset 948**
A. H. Beg and Md Zahidul Islam
School of Computing and Mathematics, Charles Sturt University, Panorama Avenue, Bathurst 2795, Australia
- 9:40AM E-16385 An Improved Partheno-Genetic Algorithm for the Multi-constrained Problem of Curling Match Arrangement 957**
Rui Ding¹, Hong Bin Dong², Jun He³ and Yu Xin Dong¹
¹*College of Computer Science and Technology Harbin Engineering University, and Mudanjiang Normal University, China;* ²*College of Computer Science and Technology Harbin Engineering University, China;* ³*Department of Computer Science Aberystwyth University, England*

Session TA-13	Multi-objective Evolutionary Algorithms
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 203
Chair	Chuan-Kang Ting / Martin Pilat

- 8:00AM E-16924 General Tuning of Weights in MOEA/D 965**
 Martin Pilát¹ and Roman Neruda²
¹Charles University in Prague, Faculty of Mathematics and Physics, Malostranské náměstí 25, 118 00 Prague, Czech Republic; ²Institute of Computer Science, Academy of Sciences of the Czech Republic, Pod Vodárenskou věží 271/2, 182 07 Prague, Czech Republic.
- 8:20AM E-16916 EliteNSGA-III: An Improved Evolutionary Many-Objective Optimization Algorithm 973**
 Amin Ibrahim¹, Shahryar Rahnamayan¹, Miguel Vargas Martin² and Kalyanmoy Deb³
¹Faculty of Electrical, Computer, and Software Engineering, University of Ontario Institute of Technology, Oshawa, Canada; ²Faculty of Business and Information Technology, University of Ontario Institute of Technology, Oshawa, Canada; ³Faculty of Electrical, Computer, and Computer Engineering, Michigan State University, East Lansing, Michigan, USA.
- 8:40AM E-17077 MOEA/D Using Covariance Matrix Adaptation Evolution Strategy for Complex Multi-Objective Optimization Problems 983**
 Ting-Chen Wang, Rung-Tzuo Liaw and Chuan-Kang Ting
Department of Computer Science and Information Engineering and Advanced Institute of Manufacturing with High-tech Innovations, National Chung Cheng University, Chia-Yi 621, Taiwan.
- 9:00AM E-26032 Indicator-Based Cooperative Coevolution for Multi-objective Optimization 991**
 Luis Miguel Antonio and Carlos A. Coello Coello
Computer Science Department, CINVESTAV-IPN (Evolutionary Computation Group), Av. IPN No. 2508, Col. San Pedro Zacatenco, Mexico City, 07300, Mexico.
- 9:20AM E-26033 IGD⁺-EMOA: A Multi-Objective Evolutionary Algorithm based on IGD⁺ 999**
 Edgar Manóatl López and Carlos A. Coello Coello
¹CINVESTAV-IPN (Evolutionary Computation Group), Departamento de Computación, México D.F. 07300, México.
- 9:40AM E-16647 Hybrid Knowledge-based Evolutionary Many-Objective Optimization 1007**
 Bin Zhang, Kamran Shafi and Hussein A. Abbass
School of Engineering and Information Technology, University of New South Wales, Canberra, Australian Capital Territory, Australia.

Session TA-14	SS CEC-26: Evolutionary Computation and Other Computational Intelligence Techniques for Cyber Security / SS CDCI-14: Computational Intelligence for Security, Surveillance, and Defense
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 204
Chair	Hongmei He / Derek T. Anderson

- 8:00AM E-16640 The Security Challenges in the IoT Enabled Cyber-Physical Systems and Opportunities for Evolutionary Computing & Other Computational Intelligence 1015**
Hongmei He¹, Carsten Maple², Tim Watson², Ashutosh Tiwari¹, Jörn Mehnen¹, Yaochu Jin³ and Bogdan Gabrys⁴
¹Department of Manufacturing, Cranfield University, Cranfield, MK43 0AL, UK; ²Cyber Security Centre — WMG, University of Warwick, UK; ³Department of Computer Science, University of Surrey, UK; ⁴School of Design, Engineering & Computing, Bournemouth University, UK
- 8:20AM E-16254 Incremental Information Gain Analysis of Input Attribute Impact on RBF-Kernel SVM Spam Detection 1022**
Hongmei He¹, Ashutosh Tiwari¹, Jörn Mehnen¹, Tim Watson², Carsten Maple², Yaochu Jin³ and Bogdan Gabrys⁴
¹School of Aerospace, Transport and Manufacturing, Cranfield University, Cranfield, MK43 0AL, UK; ²Cyber Security Centre — WMG, University of Warwick, UK; ³Department of Computer Science, University of Surrey, UK; ⁴School of Design, Engineering & Computing, Bournemouth University, UK
- 8:40AM E-16705 Genetic Boosting Classification for Malware Detection 1030**
Alejandro Martín¹, Héctor D. Menéndez² and David Camacho¹
¹Departamento de Ingeniería Informática, Universidad Autónoma, de Madrid, Spain; ²Computer Science Department University College London, United Kingdom.
- 9:00AM E-16137 Feature Selection and Neural Network Architecture Evaluation for Real-Time Video Object Classification 1038**
Phillip Curtis¹, Moufid Harb², Rami Abielmona² and Emil Petriu¹
¹University of Ottawa, School of Electrical Engineering & Computer Science, Ottawa, ON, Canada; ²Larus Technologies Corporation, Research & Engineering, Ottawa, ON, Canada.
- 9:20AM E-16495 Binary Max-sum for Clustering-based Task Allocation in the RMASBench Platform 1046**
Abel Corrêa
Universidade Federal do Rio Grande do Sul, Instituto de Informática, Caixa Postal 15064, 91.501-970, Porto Alegre, RS, Brazil.
- 9:40AM E-26013 Multiple Instance Choquet Integral for Classifier Fusion 1054**
Xiaoxiao Du¹, Alina Zare¹, James M. Keller¹ and Derek T. Anderson²
¹Department of Electrical and Computer Engineering, University of Missouri, Columbia, MO 65211; ²Electrical and Computer Engineering Department, Mississippi State University, Miss. State, MS 39762, USA.

Session TA-15	Engineering Applications
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 205
Chair	Michael Mayo / Carlos Henggeler Antunes

- 8:00AM** **E-16681** **A Differential Evolution Algorithm with Double-mode Crossover for Supply Chain Scheduling in Cold Rolling** 1062
Shengnan Zhao, Yang Yang, Qingxin Guo and Lixin Tang
The Institute of Industrial Engineering and Logistics Optimization, Northeastern University, Shenyang, China.
- 8:20AM** **E-17010** **A New Constraint Handling Method for Differential Evolution Solving Non-Convex Economic Dispatch Problems with Valve Loading Effect** 1070
Chunjiang Zhang, Yang Wu, Liang Gao and Xinyu Li
State Key Lab of Digital Manufacturing Equipment & Technology, Huazhong University of Science and Technology, Wuhan, China.
- 8:40AM** **E-16125** **An Operation Optimization Method Based on Improved EDA for BOF End-point Control** 1077
Chang Liu, Xiangman Song, Te Xu and Lixin Tang
Institute of Industrial Engineering & Logistics Optimization, Northeastern University, Shenyang, China.
- 9:00AM** **E-16041** **BlockCopy-based Operators for Evolving Efficient Wind Farm Layouts** 1085
Michael Mayo and Chen Zheng
Department of Computer Science, University of Waikato, Hamilton, New Zealand.
- 9:20AM** **E-16671** **Sensor Location in Water Distribution Networks to Detect Contamination Events — A Multiobjective Approach based on NSGA-II** 1093
Carlos Henggeler Antunes¹ and Margarida Dolores²
¹*Department of Electrical and Computer Engineering and INESC, Coimbra, University of Coimbra, Polo 2, Pinhal de Marrocos, Coimbra, Portugal;*
²*INESC Coimbra, Rua Antero de Quental, 199, Coimbra, Portugal.*
- 9:40AM** **E-16229** **A WNN Model Trained with Orthogonal Colliding Bodies Optimization for Accurate Identification of Hammerstein Plant** 1100
Arnapurna Panda and Sabyasachi Pani
School of Basic Sciences, Indian Institute of Technology Bhubaneswar, Bhubaneswar, 751007, Odisha, India.

Session TA-16	SS CEC-08A: Many-Objective Optimization
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 206
Chair	Hiroyuki Sato / Akira Oyama

- 8:00AM E-16433 Sensitivity of Performance Evaluation Results by Inverted Generational Distance to Reference Points 1107**
Hisao Ishibuchi, Hiroyuki Masuda and Yusuke Nojima
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.
- 8:20AM E-17046 Characteristics of Many-Objective Test Problems and Penalty Parameter Specification in MOEA/D 1115**
Hisao Ishibuchi, Ken Doi and Yusuke Nojima
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.
- 8:40AM E-17047 Discrete Many-objective Optimization Problems: The Case of the Pickup and Delivery Problem 1123**
Antonio López Jaimes and Abel García-Nájera
Departamento de Matemáticas Aplicadas y Sistemas, Universidad Autónoma Metropolitana Unidad Cuajimalpa, Av. Vasco de Quiroga 4871, México, D.F., México.
- 9:00AM E-17086 Clustering based Online Automatic Objective Reduction to aid Many-Objective Optimization 1131**
Monalisa Pal¹, Sriparna Saha² and Sanghamitra Bandyopadhyay¹
¹Machine Intelligence Unit, Indian Statistical Institute, 203, B. T. Road, 700108, Kolkata; ²Department of Computer Science and Technology, Indian Institute of Technology, Patna, India.
- 9:20AM E-16775 Evolutionary Computation for Many-Objective Optimization Problems Using Massive Population Sizes on the K Supercomputer 1139**
Tomoaki Tatsukawa¹, Takeshi Watanabe¹ and Akira Oyama¹
¹Tokyo University of Science, Shinjuku-ku, Tokyo, 162-8601, Japan; ²ISAS/JAXA, Sagamihara, Kanagawa, 252-5210, Japan.
- 9:40AM E-16798 How to Compare Many-Objective Algorithms under Different Settings of Population and Archive Sizes 1149**
Hisao Ishibuchi, Yu Setoguchi, Hiroyuki Masuda and Yusuke Nojima
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.

Session TA-17	SS CEC-42A: Special Session Associated with Competition on Bound Constrained Single Objective Numerical Optimization
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 207
Chair	Ponnuthurai Nagarathnam Suganthan / Thomas Stützle

- 8:00AM E-16437 A Hybrid ABC for Expensive Optimizations: CEC 2016 Competition Benchmark 1157**
 Enrico Ampellio¹ and Luca Vassio²
¹Dipartimento di Ingegneria Meccanica e Aerospaziale, Politecnico di Torino, Torino, Italy; ²Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino, Torino, Italy.
- 8:20AM E-17043 Single Phase Multi-Group Teaching Learning Algorithm for Single Objective Real-Parameter Numerical Optimization (CEC2016) 1165**
 Remya Kommadath, Chinta Sivadurgaprasad and Prakash Kotecha
 Department of Chemical Engineering, Indian Institute of Technology, Guwahati, India.
- 8:40AM E-16716 Self-adaptive Search Equation-based Artificial Bee Colony Algorithm on the CEC 2014 Benchmark Functions 1173**
 Gürçan Yavuz¹, Doğan Aydın¹ and Thomas Stützle²
¹Dumlupınar University, Computer Engineering Department, 43000 Kütahya, Turkey; ²IRIDIA, CODE, Université Libre de Bruxelles (ULB), 1050, Belgium.
- 9:00AM E-16491 Evaluating the Performance of L-SHADE with Competing Strategies on CEC2014 Single Parameter-operator Test Suite 1181**
 Radka Poláková¹, Josef Tvrdík² and Petr Bujok²
¹Centre of Excellence IT4Innovations, Institute for Research and Applications of Fuzzy Modeling, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic; ²Department of Computer Sciences, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic.
- 9:20AM E-16699 iL-SHADE: Improved L-SHADE Algorithm for Single Objective Real-Parameter Optimization 1188**
 Janez Brest, Mirjam Sepesy Maučec and Borko Bošković
 Faculty of Electrical Engineering and Computer Science, University of Maribor, Smetanova ul. 17, 2000 Maribor, Slovenia.
- 9:40AM E-16441 Cooperative Framework Fireworks Algorithm with Covariance Mutation 1196**
 Chao Yu¹, Ling Chen Kelley^{2,3} and Ying Tan¹
¹The Key Laboratory of Machine Perception and Intelligence (Ministry of Education), Department of Machine Intelligence, School of Electronics Engineering and Computer Science, Peking University, Beijing, 100871, China; ²Department of History, School of Humanities, Tsinghua University, Beijing, 100084, China; ³Department of World Languages and Cultures, College of Liberal Arts and Sciences, Auburn University at Montgomery, Montgomery, AL, 36117, United States

Session TA-18	Workshop-02: International Workshop on Neuromorphic Computing and Cyborg Intelligence / Workshop-04: Computational Intelligence Approaches for Multi-view Data Analytics
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 208+209
Chair	Huajin Tang / Giovanni Montana

- 8:00AM E-16500 Robot-to-human Handover With Obstacle Avoidance Via Continuous Time Recurrent Neural Network 1204**
Huajin Tang¹, Boon Hwa Tan² and Rui Yan¹
¹College of Computer Science, Sichuan University, Chengdu, Sichuan, China; ²Infocomm Research, Agency for Science Technology and Research (A*STAR), 138632, Singapore.
- 8:20AM E-16863 Hebbian Learning Analysis of a Grid Cell Based Cognitive Mapping System 1212**
Jun Hu¹, Miaolong Yuan¹, Huajin Tang² and Wei Yun Yau¹
¹Institute for Infocomm Research, Agency for Science Technology and Research (A*STAR), 138632, Singapore; ²College of Computer Science, Sichuan University, Chengdu, Sichuan, 610065, China.
- 8:40AM E-16190 Path Planning using a Spiking Neuron Algorithm with Axonal Delays 1219**
Jeffrey L. Krichmar
Department of Cognitive Sciences, Department of Computer Science, University of California, Irvine, CA, 92697-5100, USA.
- 9:00AM E-16466 Classification Study on Eye Movement Data: Towards A New Approach in Depression Detection 1227**
Xiaowei Li¹, Tong Cao¹, Shuting Sun¹, Bin Hu¹ and Martyn Ratcliffe²
¹School of Information Science and Engineering, Lanzhou University, Lanzhou, China; ²School of Computing, Telecommunications and Networks, Birmingham City University, Birmingham, UK.
- 9:20AM E-16710 Time Aware Knowledge Extraction to Analyze NanoSafety Cluster Scientific Activities 1233**
Carmen De Maio¹, Mimmo Parente¹, Giuseppe Fenza² and Dario Greco³
¹Dipartimento di Ingegneria dell'Informazione, ed Elettrica e Matematica Applicata, University of Salerno, Italy; ²Department of Management & Innovation Systems, University of Salerno, Italy; ³Unit of Systems Toxicology & Nanosafety Research Center, Finnish Institute of Occupational Health, Helsinki, Finland.
- 9:40AM E-16899 Hierarchical Clustering of the Electroencephalogram Spectral Coherence to Study the Changes in Brain Connectivity in Alzheimer's Disease 1241**
Nadia Mammone¹, Lilla Bonanno¹, Simona De Salvo¹, Alessia Bramanti¹, Placido Bramanti¹, Hojjat Adeli², Cosimo Ieracitano³, Maurizio Campolo³ and Francesco C. Morabito³
¹IRCCS Centro Neurolesi Bonino-Pulejo, Via Palermo c/da Casazza, SS. 113, 98124 Messina, Italy; ²Ohio State University, College of Engineering, 470 Hitchcock Hall, 2070 Neil Avenue, Columbus, Ohio; ³DICEAM Department, Mediterranean University of Reggio Calabria, Via Graziella Feo di Vito, 89060 Reggio Calabria, Italy

Session	[Plenary] – Evolutionary Machine Learning, Prof. Una-May O’Reilly
Date/Time	Tuesday, 26 July 2016 / 1:00PM – 2:00PM
Venue	Room Ballroom C
Chair	Carlos Coello Coello

Session	CDCI Poster Session
Date/Time	Tuesday, 26 July 2016 / 2:00PM – 6:00PM
Venue	Room Ballroom D
Chair	Laszlo Kockzy

- P101** **E-16939** **Optimization of Photovoltaic Power Self-Consumption using Genetic Algorithm 1249**
Rodrigo Martins¹ and Petr Musilek^{1,2}
¹*Department of Electrical and Computer Engineering, University of Alberta, Edmonton AB, Canada;* ²*Faculty of Electrical Engineering and Computer Science, VSB-Technical University, Ostrava, Czech Republic*
- P102** **E-16793** **Key Challenges and Future Directions of Dynamic Multi-objective Optimisation 1256**
Mardé Helbig¹, Kalyanmoy Deb² and Andries Engelbrecht¹
¹*Department of Computer Science, University of Pretoria, Pretoria, South Africa;* ²*Department of Electrical and Electronic Engineering, Michigan State University, East-Lansing, USA.*
- P103** **E-17036** **Multi-Objective Evolutionary Algorithms Embedded with Machine Learning — A Survey 1262**
Zhun Fan¹, Kaiwen Hu², Fang Li², Yibiao Rong², Wenji Li² and Huibiao Lin²
¹*Guangdong Provincial Key Laboratory of Digital Signal and Image Processing, Department of Electronic Engineering, Shantou University Guangdong, Shantou 515063;* ²*Department of Electronic Engineering, Shantou University, Guangdong, Shantou 515063, China*
- P104** **E-17182** **Evolutionary Computer Vision and Image Processing: some FAQs, Current Challenges and Future Perspectives 1267**
Stefano Cagnoni¹ and Mengjie Zhang²
¹*Department of Information Engineering, University of Parma, Parma, Italy;* ²*School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.*
- P105** **E-16547** **Data Integration in Genomics and Systems Biology 1272**
Angela Serra¹, Michele Fratello², Dario Greco³ and Roberto Tagliaferri¹
¹*NeuRoNe Lab, DISA-MIS University of Salerno;* ²*Department of Medical, Surgical, Neurological, Metabolic and Ageing Sciences Second University of Napoli;* ³*Unit of Systems Toxicology and Nanosafety Research Center, Finnish Institute of Occupational Health, Helsinki, Finland.*

- P106** **E-16781** **Using Latent Dirichlet Allocation to Improve Text Classification Performance of Support Vector Machine 1280**
 Yaw-Huei Chen and Shu-Fong Li
Department of Computer Sciences and Information Engineering, National Chiayi University, Chiayi, Taiwan, R.O.C.
- P107** **E-17001** **Automated Anonymization of Text Documents 1287**
 Francisco Dias¹, Nuno Mamede² and Jorge Baptista³
¹*Instituto Superior Técnico, Universidade de Lisboa, Av. Rovisco Pais, 1049-001 Lisboa, Portugal;* ²*INESC-ID Lisboa, L2F — Spoken Language Lab, R. Alves Redol, 9, 1000-029 Lisboa, Portugal;* ³*Universidade do Algarve, FCHS and CECL, Campus de Gambelas, 8005-139 Faro, Portugal.*
- P108** **E-17099** **Examining the Annealing Schedules for RNA Design Algorithm 1295**
 Halid Emre Erhan¹, Sinem Sav², Stas Kalashnikov¹ and Herbert H. Tsang³
¹*School of Computing Science, Simon Fraser University, Burnaby, British Columbia, Canada;* ²*Faculty of Engineering & Computer Science, Bilkent University, Ankara, Turkey;* ³*Applied Research Lab, Trinity Western University, Langley, British Columbia, Canada.*
- P109** **E-16039** **Evolving a Generalized Strategy for an Action-Platformer Video Game Framework 1303**
 Karine da Silva Miras de Araujo and Fabrício Olivetti de Franca
Universidade Federal do ABC (UFABC), Center of Mathematics, Computing and Cognition (CMCC), R. Santa Adélia 166, CEP 09210-170, Santo André, Brazil.
- P110** **E-16589** **Procedural Generation of Angry Birds Levels with Adjustable Difficulty 1311**
 Misaki Kaidan, Tomohiro Harada, Chun Yin Chu and Ruck Thawonmas
Intelligent Computer Entertainment Laboratory, Graduate School of Information Science and Engineering, Ritsumeikan University, Shiga, Japan
- P111** **E-16948** **A Methodological Approach for Algorithmic Composition Systems' Parameter Spaces Aesthetic Exploration 1317**
 Iván Paz, Àngela Nebot, Enrique Romero, Francisco Mugica and Alfredo Vellido
Soft Computing Research Group, Computer Science Department, Universitat Politècnica de Catalunya — Barcelona Tech, C. Jordi Girona 1-3, 08034 Barcelona, Spain.
- P112** **E-16471** **Efficient Diagnosis System for Parkinson's Disease Using Deep Belief Network 1324**
 Ali H. Al-Fatlawi¹, Mohammed H. Jabardi¹ and Sai Ho Ling²
¹*CNR Lab, Information Technology, Research and Development Center, University of Kufa, Najaf, Iraq;* ²*Centre for Health Technologies, University of Technology Sydney, Sydney, Australia.*
- P113** **E-16565** **Selecting Optimal EEG Channels for Mental Tasks Classification: An Approach using ICA 1331**
 Rifai Chai, Ganesh R. Naik, Tuan N. Nguyen, Sai Ho Ling, Yvonne Tran and Hung T. Nguyen
Centre for Health Technologies, Faculty of Engineering and Information Technology, University of Technology, Sydney, NSW, Australia.

- P114** **E-16332** **A Procurement Decision Support Mechanism on Multi-attribute Fuzzy-interval Auctions 1336**
Camilo Franco, Jens Leth Hougaard and Kurt Nielsen
IFRO, Faculty of Science, Copenhagen University, 1870 Frederiksberg C.
- P115** **E-16119** **A New Flood Forecasting Model based on SVM and Boosting Learning Algorithms 1343**
Shijin Li, Kaikai Ma, Zhou Jin and Yuelong Zhu
School of Computer & Information, Hohai University, Nanjing, China.
- P116** **E-16285** **Deep Neural Networks for Precipitation Estimation from Remotely Sensed Information 1349**
Yumeng Tao¹, Xiaogang Gao¹, Alexander Ihler², Kuolin Hsu¹ and Soroosh Sorooshian¹
¹Center for Hydrometeorology and Remote Sensing (CHRS), Department of Civil and Environmental Engineering, University of California, Irvine, Irvine, 92697-2700, California; ²Department of Computer Science, University of California, Irvine, Irvine, 92697-3435, California, USA.
- P117** **E-16032** **Optimizing Natural Gas Sensors Allocation in Oil Platforms Using Genetic Algorithms 1356**
Dinart Duarte Braga and Marco Aurélio Cavalcanti Pacheco
Electrical Engineering Department, Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro, Brazil.
- P118** **E-16630** **Detection of Anomalies in Activity Patterns of Lone Occupants from Electricity Usage Data 1361**
Kuanlong Leong¹, Cyril Leung^{1,2}, Chunyan Miao² and Yu Christine Chen¹
¹Department of Electrical and Computer Engineering, The University of British Columbia (UBC), Canada; ²Joint NTU-UBC Research Centre of Excellence in Active Living for the Elderly, Nanyang Technological University (NTU), Singapore.
- P119** **E-17124** **An ANN Approach for False Alarm Detection in Microwave Breast Cancer Detection 1370**
Lakhvinder Singh Solanki¹, Surinder Singh¹ and Dharmendra Singh²
¹Department of Electronics and Communication Engineering, Sant Longowal Institute of Engineering & Technology, Longowal, District Sangrur, Punjab, India; ²Department of Electronics and Computer Engineering, IIT, Roorkee, Uttarakhand, India
- P120** **E-26034** **Vector Directed Path Generation and Tracking for Autonomous Unmanned Aerial/ Ground Vehicles 1375**
Willson Amalraj Arokiasami, Prahlad Vadakkepat, Kay Chen Tan and Dipti Srinivasan
Department of Electrical and Computer Engineering, National University of Singapore, Singapore.
- P121** **E-16263** **Multi-linear Regression Coefficient Classifier for Recognition 1382**
Qingxiang Feng¹, Qi Zhu², Chun Yuan³ and Ivan Lee⁴
¹Faculty of Science and Technology, University of Macau, Macau, China; ²College of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics, Nanjing, China; ³Shenzhen Graduate School, Tsinghua University, Shenzhen, Shenzhen, China; ⁴School of IT and Mathematical Sciences, University of South Australia, Adelaide, Australia

- P122** **E-16755** **An Efficient Sparse Representation Based Classification for Undersampled Face Recognition 1388**
 Zizhu Fan¹, Lipan Kang¹ and Zuoyong Li²
¹*School of Basic Science, East China Jiaotong University, Nanchang, China;*
²*Fujian Provincial Key Laboratory of Information, Processing and Intelligent Control, Fuzhou, China.*
- P123** **E-17040** **Enhanced Obfuscation for Multi-part Biometric Templates 1394**
 Vikas Gottemukkula¹, Reza Derakhshani² and Sashi K. Saripalle¹
¹*EyeVerify, Inc., Kansas City, USA;* ²*CSEE Department, University of Missouri Kansas City, Kansas City, USA.*
- P124** **E-16978** **Fast and Efficient Multimodal Eye Biometrics using Projective Dictionary Pair Learning 1402**
 Abhijit Das¹, Prabir Mondal², Umapada Pal², Miguel Angel Ferrer³ and Michael Blumenstein⁴
¹*Institute for Integrated and Intelligent Systems, Griffith University, Queensland, Australia;* ²*Computer Vision and Pattern Recognition Unit, Indian Statistical Institute, Kolkata, India;* ³*IDeTIC, University of Las Palmas de Gran Canaria, Las Palmas, Spain;* ⁴*School of Software, University of Technology Sydney, Australia.*
- P125** **E-16754** **An Adaptive Output Regulation Approach for Formation Control of Heterogeneous Multi-Agent Systems 1410**
 Shaobao Li¹, Meng Joo Er¹, Ning Wang² and Chiang-Ju Chien³
¹*School of Electrical and Electronic Engineering, Nanyang Technological University, 639798, Singapore;* ²*Marine Engineering College, Dalian Maritime University, Dalian, 116026, China;* ³*Department of Electronic Engineering, Huafan University, Taiwan.*
- P126** **E-17123** **Lesion Border Detection Using Deep Learning 1416**
 Peyman Sabouri and Hamid GholamHosseini
Department of Electrical and Electronics Engineering, School of Engineering, Computer and Mathematical Sciences, Auckland University of Technology, Private bag 92006, Auckland 1142, New Zealand.
- P127** **E-16572** **Verifying Effectiveness of an Expression Education Support Robot that Nods and Gives Hints 1422**
 Koki Suzuki¹, Shogo Yamada² and Masayoshi Kanoh³
¹*Graduate School of Computer and Cognitive Sciences, Chukyo University, 101-2 Yagoto Honmachi, Showa-ku, Nagoya 466-8666, Japan;* ²*School of Information Science and Technology, Chukyo University, 101-2 Yagoto Honmachi, Showa-ku, Nagoya 466-8666, Japan;* ³*School of Engineering, Chukyo University, 101-2 Yagoto Honmachi, Showa-ku, Nagoya 466-8666, Japan.*
- P128** **E-16574** **RNN with Russell's Circumplex Model for Emotion Estimation and Emotional Gesture Generation 1427**
 Takuya Tsujimoto¹, Yasutake Takahashi¹, Shouhei Takeuchi¹ and Yoichiro Maeda²
¹*University of Fukui, Bunkyo 3-9-1, Fukui, Fukui, 910-8507, Japan;* ²*Institute of Technologists, 333 Maeya, Gyoda-city, Saitama 361-0038, Japan.*

Session TM-12	Numerical Optimization
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 202
Chair	Shinichi Shirakawa / Amin Rahati

- 2:30PM** **E-17071** **Impact of Invariant Objective for Order Preserving Transformation in Bayesian Optimization 1432**
Shinichi Shirakawa
Faculty of Environment and Information Science, Yokohama National University, Yokohama, Kanagawa, Japan.
- 2:50PM** **E-16853** **Accelerating Evolutionary Computation Using Estimated Convergence Points 1438**
Jun Yu¹, Yan Pei² and Hideyuki Takagi³
¹Graduate School of Design, Kyushu University, Fukuoka, 815-8540, Japan;
²Computer Science Division, the University of Aizu, Aizu-wakamatsu, 965-8580, Japan; ³Faculty of Design, Kyushu University, Fukuoka, 815-8540, Japan
- 3:10PM** **E-16569** **A Gene Expression Programming Framework for Evolutionary Design of Metaheuristic Algorithms 1445**
Amin Rahati and Hojjat Rakhshani
Department of Computer Science, University of Sistan and Baluchestan, Zahedan, Iran.
- 3:30PM** **E-16632** **A Modified Sensitivity Analysis Method for Driving a Multidimensional Search in the Artificial Bee Colony Algorithm 1453**
Peio Loubière¹, Astrid Jourdan¹, Patrick Siarry² and Rachid Chelouah¹
¹EISTI, Cergy-Pau, France; ²LISSI, E.A. 3956 — UPEC, Vitry-sur-Seine, France.
- 3:50PM** **E-16668** **Feature-Based Algorithm Selection for Constrained Continuous Optimisation 1461**
Shayan Poursoltan and Frank Neumann
Optimisation and Logistics, School of Computer Science, The University of Adelaide, Adelaide, SA 5005, Australia
- 4:10PM** **E-16929** **Evolutionary Partitioning Regression with Function Stacks 1469**
Daniel Ashlock¹ and Joseph Alexander Brown²
¹Department of Mathematics and Statistics at the University of Guelph;
²Artificial Intelligence Games in Development Lab, Innopolis University, Innopolis, Republic of Tatarstan, Russia.

Session TM-13	Heuristics, Metaheuristics and Hyper-heuristics
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 203
Chair	Ana Bazzan / Kei Ohnishi

2:30PM E-16409 A Self-Tuning Modified Firefly Algorithm to Solve Univariate Nonlinear Equations with Complex Roots 1477

M. K. A. Ariyaratne¹, T. G. I. Fernando² and S. Weerakoon³
¹Department of Computer Science, Faculty of Computing, General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka; ²Department of Computer Science, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegods, Sri Lanka; ³Department of Mathematics, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegods, Sri Lanka.

2:50PM E-16861 Case Study: An Analysis of Accidental Complexity in a State-of-the-art Hyper-heuristic for HyFlex 1485

Steven Adriaensen and Ann Nowé
Vrije Universiteit Brussel, Brussels, Belgium.

3:10PM E-17074 Efficient Local Search in Traffic Assignment 1493

Gabriel de O. Ramos and Ana L. C. Bazzan
Instituto de Informática, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil.

3:30PM E-16272 Bayesian Charged System Search: A Hybrid Method for Multi-Modal Optimization Problems 1501

Mashall Aryan¹ and B. Alireza M. Alizadeh
¹School of Engineering and Computer Science, Victoria University of Wellington; ²Department of Informatics, University of Hamburg, Germany.

3:50PM E-16645 Non-swarm Intelligence Search Algorithm Based on the Foraging Behaviors of Fruit Flies 1509

Kei Ohnishi, Akihiro Fujiwara and Mario Koeppen
Graduate School of Computer Science and System Engineering, Kyushu Institute of Technology, Kawazu 680-4, Iizuka, Fukuoka 820-8502, Japan.

4:10PM E-16856 Hybrid Parameter Control Approach Applied to a Diversity-based Multi-objective Memetic Algorithm for Frequency Assignment Problems 1517

Eduardo Segredo¹, Ben Paechter¹, Emma Hart¹ and Carlos Ignacio González-Vila²
¹School of Computing, Edinburgh Napier University, Edinburgh, Scotland, UK; ²Instituto Tecnológico y de Energías Renovables (ITER), Santa Cruz de Tenerife, Spain.

Session TM-14	Real-world Applications
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 204
Chair	Elizabeth Wanner / Simone Ludwig

- 2:30PM** **E-16930** **Portfolio Selection for Open-pit Mining Assets Acquisition 1525**
Lucas S. Ferreira¹, Elizabeth Fialho Wanner¹, Adriano C. Lisboa² and Douglas A. G. Vieira²
¹Department of Computer Engineering, CEFET-MG — Brazil; ²ENACOM, Brazil
- 2:50PM** **E-16268** **Improved Glowworm Swarm Optimization Algorithm applied to Multi-level Thresholding 1533**
Simone A. Ludwig
North Dakota State University, Fargo, ND, USA.
- 3:10PM** **E-17130** **Considerations in Developing a Scalable Wind Power Forecasting Solution 1541**
Shane Butler¹, Des Farren² and John V. Ringwood¹
¹Department of Electronic Engineering, Maynooth University, County Kildare, Ireland; ²Servusnet Informatics Ltd., Co. Cork, Ireland.
- 3:30PM** **E-16371** **Fundamentals of the C-DEEPSO Algorithm and its Application to the Reactive Power Optimization of Wind Farms 1547**
Carolina G. Marcelino¹, Paulo E. M. Almeida¹, Elizabeth F. Wanner¹, Leonel M. Carvalho² and Vladimiro Miranda²
¹Intelligent Systems Laboratory, CEFET-MG — Brazil; ²Centre for Power and Energy Systems — CPES, INESC TEC — Portugal.
- 3:50PM** **E-16968** **Multiple Pass Monte Carlo Tree Search 1555**
Cameron McGuinness
Department of Mathematics and Statistics at the University of Guelph in Guelph, Ontario, N1G2W1, Canada.

Session TM-15	Representation and Operators
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 205
Chair	Daniel Ashlock / James Montgomery

- 2:30PM** **E-16941** **Evolvable Warps for Data Normalization 1562**
 Jeremy Gilbert and Daniel Ashlock
University of Guelph, Canada
- 2:50PM** **E-16008** **Conway Crossover to Create Hyperdimensional Point Packings, with Applications 1570**
 Daniel Ashlock¹ and Steffen Graether¹
¹*Department of Mathematics and Statistics at the University of Guelph;*
²*Department of Molecular and Cellular Biology at the University of Guelph, Canada*
- 3:10PM** **E-16592** **An Adaptive Generative Representation for Evolutionary Computation 1578**
 Daniel Ashlock¹ and James Montgomery²
¹*Department of Mathematics and Statistics at the University of Guelph, in Ontario, Canada;* ²*School of Engineering and ICT, University of Tasmania, Australia.*
- 3:30PM** **E-16809** **The Do What's Possible Representation 1586**
 Daniel Ashlock¹, Sierra Gillis¹, Andrew McEachern² and Jeffrey Tsang³
¹*Department of Mathematics and Statistics at the University of Guelph;*
²*Maluuba Inc., Waterloo, CA;* ³*Department of Mathematics and Statistics, at Queen's University, Canada.*
- 3:50PM** **E-16846** **Adding Local Edge Mobility to Graph Evolution 1594**
 Daniel Ashlock and Meghan Timmins
Department of Mathematics and Statistics at the University of Guelph, in Guelph, Ontario, N1G 2W1, Canada.
- 4:10PM** **E-16548** **A Comparison of Implementations of Basic Evolutionary Algorithm Operations in Different Languages 1602**
 Juan-Julian Merelo-Guervo¹, Israel Blancas-Álvarez¹, Pedro A. Castillo¹, Gustavo Romero¹, Victor M. Rivas², Mario García-Valdez³, Amaury Hernández-Águila³ and Mario Román⁴
¹*CITIC and Computer Architecture and Technology Department, University of Granada (Spain);* ²*Department of Computer Sciences, University of Jaén (Spain);* ³*Tijuana Institute of Technology (Mexico);* ⁴*University of Granada (Spain).*

Session TM-16	SS CEC-08B: Many-Objective Optimization / SS CEC-17A: Computationally Expensive Optimization
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 206
Chair	Yue-Jiao Gong / Karthik Sindhya

- 2:30PM E-16504 A Hybrid Evolutionary Algorithm with Dual Populations for Many-Objective Optimization 1610**
 Yu-Hui Zhang¹, Yue-Jiao Gong¹, Jun Zhang² and Ying-biao Ling¹
¹Key Laboratory of Machine Intelligence and Advanced Computing, Ministry of Education, Guangzhou 510006, Guangdong, China; ²School of Computer Science and Engineering, South China University of Technology, Guangzhou 510006, Guangdong, China
- 2:50PM E-26022 An Improved Visualization Approach in Many-Objective Optimization 1618**
 Zhenan He¹ and Gary G. Yen²
¹College of Computer Science, Sichuan University, Chengdu, Sichuan, China; ²School of Electrical and Computer Engineering, Oklahoma State University, Stillwater, Oklahoma, USA.
- 3:10PM E-26043 Enhanced Decomposition-Based Many-Objective Optimization Using Supplemental Weight Vectors 1626**
 Hiroyuki Sato, Satoshi Nakagawa, Minami Miyakawa and Keiki Takadama
 Graduate School of Information and Engineering Sciences, The University of Electro-Communications, 1-5-1 Chofugaoka, Chofu, Tokyo, Japan.
- 3:30PM E-16377 Multi-objective Variable Subset Selection Using Heterogeneous Surrogate Modeling and Sequential Design 1634**
 Joachim van der Herten, Ivo Couckuyt, Dirk Deschrijver and Tom Dhaene
 Internet Based Communication Networks and Services (IBCN), Ghent University — iMinds, Technologiepark 15, B-9052 Gent, Belgium.
- 3:50PM E-16328 State-based Representation for Structural Topology Optimization and Application to Crashworthiness 1642**
 Nikola Aulig and Markus Olhofer
¹Honda Research Institute Europe GmbH, Carl-Legien-Straße 30, 63073 Offenbach/Main, Germany.
- 4:10PM E-16071 A Surrogate Model Assisted Evolutionary Algorithm for Computationally Expensive Design Optimization Problems with Discrete Variables 1650**
 Bo Liu¹, Nan Sun¹, Qingfu Zhang², Georges Gielen³ and Vic Grout¹
¹Department of Computing, Glyndwr University, UK; ²Department of Computer Science, City University of Hong Kong, Kowloon, Hong Kong SAR; ³ESAT-MICAS, Katholieke Universiteit Leuven, Belgium.

Session TM-17	SS CEC-23A: Memetic Computing
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 207
Chair	Liang Feng / Maoguo Gong

- 2:30PM E-26044 A Preliminary Study on Distance Selection in Probabilistic Memetic Framework for Capacitated Arc Routing Problem 1687**
Zhenbin Ye¹, Liang Feng¹, Yew-Soon Ong², Kai Liu¹, Chao Chen¹ and Edwin Sha¹
¹College of Computer Science, Chongqing University, China; ²School of Computer Engineering, Nanyang Technological University, Singapore.
- 2:50PM E-26025 Evolutionary Multitasking across Single and Multi-Objective Formulations for Improved Problem Solving 1695**
Bingshui Da¹, Abhishek Gupta¹, Yew-Soon Ong¹ and Liang Feng²
¹School of Computer Engineering, Nanyang Technological University, 639798, Singapore; ²College of Computer Science, Chongqing University, 400044, China.
- 3:10PM E-16496 Enhancing Evolutionary Multifactorial Optimization based on Particle Swarm Optimization 1658**
Tian Xie¹, Maoguo Gong¹, Zedong Tang¹, Yu Lei², Jia Liu¹ and Zhao Wang¹
¹Key Laboratory of Intelligent Perception and Image Understanding, Xidian University, Xi'an, China; ²School of Electronics and Information, Northwestern Polytechnical University, Xi'an, China.
- 3:30PM E-16794 A Memetic Evolutionary Algorithm For Bi-level Combinatorial Optimization: A Realization between Bi-MDVRP and Bi-CVRP 1666**
Abir Chaabani, Slim Bechikh and Lamjed Ben Said
Lab. SOIE. Strategie d'Optimisation et Informatique IntelligentE, ISG, Institut Supérieur de Gestion, Université de Tunis, Tunisie.
- 3:50PM E-16582 A Memetic Algorithm for Multi-objective Optimization Problems with Interval Parameters 1674**
Dunwei Gong¹, Zhuang Miao¹ and Jing Sun²
¹School of Information and Electrical Engineering, China University of Mining and Technology, Xuzhou, China; ²School of Sciences, Huaihai Institute of Technology, Lianyungang, China.
- 4:10PM E-17073 Variable Neighborhood based Memetic Algorithm for Distributed Assembly Permutation Flowshop 1682**
Keyao Wang¹, Ran Zhang¹ and Bo Liu²
¹Astronautics School, Beihang University, Beijing 100191, China; ²Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing 100190, China.

Session TM-18	SS CDCI-30: Human Symbiotic Systems / SS CDCI-18: Computational Intelligence for Unmanned Systems
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 208+209
Chair	Tomohiro Yoshikawa / Hongwei Mo

- 2:30PM E-16430 Analysis of Human Comfort by 1/f Fluctuation for Chaotic Sound Generation System 1702**
Yoichiro Maeda
Institute of Technologists, 333 Maeya, Gyoda City, Saitama, 361-0038, Japan.
- 2:50PM E-16691 Japanese Kanji-Calligraphic Font Design using Onomatopoeia Utterance 1708**
Kenichi Murata¹, Tsuyoshi Nakamura¹, Kazuya Endo², Masayoshi Kanoh² and Koji Yamada³
¹Nagoya Institute of Technology; ²Chukyo University; ³Institute of Advanced Media, Arts and Sciences.
- 3:10PM E-17117 Multi-Layer Situation Model for Robot Integration Systems 1714**
Satoshi Yokoi, Hiroyuki Masuta, Toru Oshima, Ken'ichi Koyanagi and Tatsuo Motoyoshi
Toyama Prefectural University, Department of Intelligent Systems Design Engineering, Imizu, Toyama, Japan.
- 3:30PM E-17034 Leg Control based on Human Motion Prediction Using Motion Sensor for Power Assist Suit without Binding Knee 1720**
Takuya Inoue, Shinnosuke Nomura, Yasutake Takahashi, Masayuki Kawai and Yoshiaki Taniai
Graduate School of Engineering, University of Fukui, Bunkyo 3-9-1, Fukui, Fukui, 910-8507, Japan.
- 3:50PM E-16802 Improving Constrained Glider Trajectories for Ocean Eddy Border Sampling within Extended Mission Planning Time 1727**
Aleš Zamuda¹, José Daniel Hernández Sosa² and Leonhard Adler²
¹Faculty of Electrical Engineering and Computer Science, University of Maribor, Smetanova ul. 17, 2000 Maribor, Slovenia; ²Institute of Intelligent Systems and Numerical Applications in Engineering, University of Las Palmas de Gran Canaria, Campus de Tafira, 35017 Las Palmas de Gran Canaria, Spain.
- 4:10PM E-16324 A Multi-Modal Optimization Approach to Single Path Planning for Unmanned Aerial Vehicle 1735**
Peng Yang¹, Guanzhou Lu¹, Ke Tang¹ and Xin Yao²
¹USTC-Birmingham Joint Research Institute in Intelligent Computation and Its Applications (UBRI), School of Computer Science and Technology, University of Science and Technology of China, Hefei, 230027, China; ²The Centre of Excellence for Research in Computational Intelligence and Applications (CERCIA), School of Computer Science, University of Birmingham, Birmingham B15 2TT, UK.

Session TP-12	Numerical Optimization / SS CEC-25A: Bat Algorithm and Cuckoo Search
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 202
Chair	Xin-She Yang / Germano Vasconcelos

- 4:30PM E-16971 The Paradox of Multimodal Optimization: Concepts vs. Species in Single and Multi-objective Problems 1743**
 Amiram Moshaiov
School of Mechanical Engineering, Tel-Aviv University, Tel-Aviv, Israel
- 4:50PM E-16231 Bio-inspired BAT optimization Algorithm for Handwritten Arabic Characters Recognition 1749**
 Ahmed. T. Sahlol¹, Ching Y. Suen², Hossam M. Zawbaa³, Mohamed Abd Elfattah⁴ and Aboul Ella Hassanien⁵
¹*Faculty of Specific Education, Damietta University, Damietta, Egypt;*
²*Director of CENPRMI, Faculty of Engineering and Computer Sciences, Concordia University, Canada;* ³*Faculty of Mathematics and Computer Science, Babes-Bolyai University, Romania and Faculty of Computers and Information, Beni-Suef University, Egypt;* ⁴*Faculty of Computers and Information, Mansoura University, Egypt;* ⁵*Faculty of Computers and Information, Cairo University, Egypt.*
- 5:10PM E-17094 A Modified Cuckoo Search Algorithm for Dynamic Optimization Problems 1757**
 Yuta Umenai, Fumito Uwano, Yusuke Tajima, Masaya Nakata, Hiroyuki Sato and Keiki Takadama
The University of Electro-Communications, Tokyo, Japan.
- 5:30PM E-16708 Cuckoo Search Optimization for Short Term Wind Energy Forecasting 1765**
 Carlos Eduardo M. Barbosa and Germano C. Vasconcelos
Center of Informatics, Federal University of Pernambuco, Recife, Brazil.
- 5:50PM E-16072 An Improved Bat Algorithm with Variable Neighborhood Search for Global Optimization 1773**
 Gai-Ge Wang^{1,2}, Mei Lu¹ and Xiang-Jun Zhao¹
¹*School of Computer Science and Technology, Jiangsu Normal University, Xuzhou, China;* ²*Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Alberta, Canada*
- 6:10PM E-16341 Adaptive Firefly Algorithm with Alternative Search 1779**
 Hui Wang^{1,2}, Wenjun Wang³, Hui Sun^{1,2}, Jia Zhao^{1,2}, Xiang Yu^{1,2}, Li Lv^{1,2} and Huasheng Zhu^{1,2}
¹*School of Information Engineering, Nanchang Institute of Technology, Nanchang, 330099, China;* ²*Jiangxi Province Key Laboratory of Water Information Cooperative Sensing and Intelligent Processing, Nanchang, 330099, P.R. China;* ³*School of Business Administration, Nanchang Institute of Technology, Nanchang, 330099, China*

Session TP-13	Artificial Immune Systems / Coevolutionary Systems
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 203
Chair	Mateus Giesbrecht / Mohammad Nabi Omidvar

- 4:30PM** **E-16374** **An Immuno Inspired Proposal to Solve the Time Series Realization Problem 1786**
Mateus Giesbrecht and Celso Pascoli Bottura
School of Electrical and Computing Engineering, University of Campinas, Campinas, SP, Brazil.
- 4:50PM** **E-17066** **A New Approach to Optimized Negative Selection 1793**
Brian Schmidt and Ala Al-Fuqaha
Computer Science Department, College of Engineering and Applied Sciences, Western Michigan University, Kalamazoo, Michigan, USA.
- 5:10PM** **E-26053** **An Immune Inspired Framework for Optimization in Dynamic Environment 1800**
Weiwei Zhang¹, Gary G. Yen² and Xiao Wang¹
¹*School Computer & Communication Engr, Zhengzhou University of Light Industry, Zhengzhou, Henan, 450002, ChinaA;* ²*School Electrical Engineering, Oklahoma State University, Stillwater, OK 74078, USA*
- 5:30PM** **E-16021** **Leap on Large-scale Nonseparable Problems 1808**
Zhou Wu¹ and Mingbo Zhao²
¹*School of Automation, Chongqing University, Shapingba, Chongqing, China;* ²*Department of Electronic Engineering, City University of Hong Kong, Kowloon, Hong Kong, China.*
- 5:50PM** **E-16426** **Distributed Resource Allocation as Co-Evolution Problem 1815**
Sven Tomforde¹, David Meier², Anthony Stein² and Sebastian von Mammen²
¹*Intelligent Embedded Systems, Kassel University, Germany;* ²*Organic Computing, University of Augsburg, Germany.*
- 6:10PM** **E-16835** **Contribution Based Multi-Island Competitive Cooperative Coevolution 1823**
Kavitesh Bali¹, Rohitash Chandra² and Mohammad N. Omidvar³
¹*School of Computing Information and Mathematical Sciences, University of the South Pacific, Suva, Fiji;* ²*Artificial Intelligence and Cybernetics Research Group, Software Foundation, Nausori, Fiji;* ³*School of Computer Science, University of Birmingham, Birmingham B15 2TT, UK.*

Session TP-14	Particle Swarm Optimization
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 204
Chair	Kenya Jin'no / Christiaan Scheepers

- 4:30PM** **E-16587** **Applying PSO to Natural Language Processing Tasks: Optimizing the Identification of Syntactic Phrases 1831**
George Tambouratzis
Department of Machine Translation, Institute for Language and Speech Processing / Athena Research Centre, 6 Artemidos & Epidavrou Str., Paradissos Amaroussiou, 151 25, Greece.
- 4:50PM** **E-16662** **An Improved Rotationally Invariant PSO: A Modified Standard PSO-2011 1839**
Yosuke Hariya, Takuya Shindo and Kenya Jin'no
Nippon Institute of Technology, Saitama, 345--8501, Japan.
- 5:10PM** **E-16317** **Vector Evaluated Particle Swarm Optimization Exploration Behavior Part I: Explorative Analysis 1845**
Christiaan Scheepers and Andries P. Engelbrecht
Department of Computer Science, University of Pretoria, South Africa.
- 5:30PM** **E-16584** **Vector Evaluated Particle Swarm Optimization Exploration Behavior Part II: Quantitative Analysis 1855**
Christiaan Scheepers and Andries P. Engelbrecht
Department of Computer Science, University of Pretoria, South Africa.
- 5:50PM** **E-16865** **Group-Based Stochastic Scaling for PSO Velocities 1862**
ET van Zyl and A. P. Engelbrecht
Department of Computer Science, University of Pretoria, Pretoria, South Africa.
- 6:10PM** **E-16912** **Static Learning Particle Swarm Optimization with Enhanced Exploration and Exploitation using Adaptive Swarm Size 1869**
Aditya Panda¹, Srijan Ghoshal¹, Amit Konar¹, Bonny Banerjee² and Atulya K. Nagar³
¹*Department Electronics & Telecommunication Engineering, Jadavpur University, Kolkata, 70032, India;* ²*Electrical and Computer Engineering Department, University of Memphis, 3815, Central Ave, Memphis, TN 38152, USA;* ³*Liverpool Hope University, Hope Park, Liverpool, L16 9JD. UK.*

Session TP-15	SS CEC-07: Evolutionary Bilevel Optimization
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 205
Chair	Ankur Sinha / Hemant Singh

- 4:30PM** **E-16923** **Solving Optimistic Bilevel Programs by Iteratively Approximating Lower Level Optimal Value Function 1877**
Ankur Sinha¹, Pekka Malo² and Kalyanmoy Deb³
¹*Production and Quantitative Methods, Indian Institute of Management, Ahmedabad, 380015, India;* ²*Department of Information and Service Economy, Aalto University School of Business, PO Box 21220, 00076 Aalto, Finland;* ³*Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, USA.*
- 4:50PM** **E-17052** **A Differential Evolution Algorithm for Bilevel Problems Including Linear Equality Constraints 1885**
Karla A. P. Lagares¹, Jaqueline S. Angelo², Heder S. Bernardino¹, Helio J. C. Barbosa^{1,2}
¹*Universidade Federal de Juiz de Fora, Juiz de Fora, MG, Brazil;* ²*Laboratório Nacional de Computação Científica, Petrópolis — RJ, Brazil.*
- 5:10PM** **E-17151** **Handling Inverse Optimal Control Problems using Evolutionary Bilevel Optimization 1893**
Varun Suryan¹, Ankur Sinha², Pekka Malo³ and Kalyanmoy Deb⁴
¹*Department of Mechanical Engineering, Indian Institute of Technology Jodhpur, India;* ²*Production and Quantitative Methods, Indian Institute of Management Ahmedabad, India;* ³*Department of Information and Service Economy, Aalto University School of Business, Finland;* ⁴*Computer Science and Engineering, Michigan State University, USA.*
- 5:30PM** **E-16082** **A Memetic Algorithm for Solving Bilevel Optimization Problems with Multiple Followers 1901**
Md Monjurul Islam, Hemant Kumar Singh and Tapabrata Ray
School of Engineering and Information Technology, University of New South Wales, Canberra ACT, Australia.
- 5:50PM** **E-17112** **Metamodel-Based Prediction of Performance Metrics for Bilevel Parameter Tuning in MOEAs 1909**
Sunith Bandaru, Martin Andersson and Amos H. C. Ng
School of Engineering Science, University of Skövde, Skövde, Sweden.

Session TP-16	SS CEC-17B: Computationally Expensive Optimization
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 206
Chair	Wolfgang Konen / Abhishek Gupta

- 4:30PM E-26002 Pareto Rank Learning for Multi-Objective Bi-Level Optimization: A Study in Composites Manufacturing 1940**
A. Gupta¹, Y. S. Ong¹, P. A. Kelly² and C. K. Goh³
¹Rolls-Royce@NTU Corporate Lab c/o, School of Computer Engineering, Nanyang Technological University, Singapore; ²Department of Engineering Science, University of Auckland, New Zealand; ³Rolls Royce Energy Systems, Singapore.
- 4:50PM E-16168 A Hybrid Sequential Sampling based Metamodelling Approach for High Dimensional Problems 1917**
Selvakumar Ulaganathan¹, Ivo Couckuyt¹, Tom Dhaene¹, Eric Laermans¹ and Joris Degroote²
¹Ghent University — iMinds, Department of Information Technology (INTEC), Technologiepark-Zwijnaarde 15, 9052 Ghent, Belgium; ²Ghent University, Department of Flow, Heat and Combustion Mechanics, Sint — Pietersnieuwstraat 41, Ghent, 9000, Belgium
- 5:10PM E-16349 Equality Constraint Handling for Surrogate-Assisted Constrained Optimization 1924**
Samineh Bagheri¹, Wolfgang Konen¹ and Thomas Bäck²
¹Department of Computer Science, TH Köln (University of Applied Sciences), 51643, Gummersbach, Germany; ²Department of Computer Science, Leiden University, LIACS, 2333 CA Leiden, The Netherlands.
- 5:30PM E-16159 A New Optimal Resource Allocation Scheme for Computationally Expensive Problems 1932**
Yi Sun, Albert Y. S. Lam and Victor O. K. Li
Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong.
- 5:50PM E-16331 Evolutionary Computation for Topology Optimization of Mechanical Structures: An Overview of Representations 1948**
Nikola Aulig and Markus Olhofer
¹Honda Research Institute Europe GmbH, Carl-Legien-Straße 30, 63073 Offenbach/Main, Germany.
- 6:10PM E-16887 Enhancing Covariance Matrix Adaptation Evolution Strategy through Fitness Inheritance 1956**
Rung-Tzuo Liaw and Chuan-Kang Ting
Department of Computer Science and Information Engineering and Advanced Institute of Manufacturing with High-tech Innovations, National Chung Cheng University, Chia-Yi 621, Taiwan.

Session TP-17	SS CEC-23B: Memetic Computing / Classification, Clustering, Data Analysis and Data Mining
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 207
Chair	Zexuan Zhu / Shinya Watanabe

- 4:30PM E-16854 Multi-objective Memetic Algorithm for Solving Pickup and Delivery Problem with Dynamic Customer Requests and Traffic Information 1964**
Jun Xiao¹, Yanming Yang¹, Xiaoliang Ma¹, Jiarui Zhou² and Zexuan Zhu¹
¹College of Computer Science and Software Engineering, Shenzhen University, Shenzhen 518060; ²School of Computer Science and Technology, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, 518055, China
- 4:50PM E-17108 A Novel Water Wave Optimization based Memetic Algorithm for Flow-Shop Scheduling 1971**
Xin Yun, Xiaoyi Feng, Xin Lyu, Shouyang Wang and Bo Liu
Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, 100190, China.
- 5:10PM E-16702 On-demand Correlation-Based Information Hierarchical Structuring Method (CIHSM) for Non-dominated Solutions 1977**
Shinya Watanabe¹, Sho Nakano², Kazuhisa Chiba³ and Masahiro Kanazaki⁴
¹College of Information and Systems, Muroran Institute of Technology, 27-1, Mizumoto-cho, Muroran 050-8585, Japan; ²Muroran Institute of Technology; ³The University of Electro-Communications; ⁴Tokyo Metropolitan University, Japan.
- 5:30PM E-26041 Optimization of Workload Level Estimation Using Selection of EEG Channel Connectivity 1985**
Kevin Ardian¹, Fumihiko Taya¹, Yu Sun¹, Anastasios Bezerianos¹, Kevin Ardian² and Tan Kay Chen²
¹Singapore Institute for Neurotechnology, National University of Singapore, Singapore, Singapore; ²Department of Electrical and Computer Engineering, National University of Singapore, Singapore.
- 5:50PM E-16226 An Evolutionary Sampling Approach with Adaptive Lévy Probability Distribution 1991**
Chaoru Hu¹, Jun Sun¹ and Tian Na²
¹School of IoT Engineering, Jiangnan University, Wuxi, Jiangsu, 214122, China; ²School of Humanities, Jiangnan University, Wuxi, Jiangsu, 214122, China.

Session TP-18	Workshop-01B: The 3rd International Workshop on Computational Energy Management in Smart Grids
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 208+209
Chair	Stefano Squartini / Petr Musilek

- 4:30PM** **E-16454** **Supplementary Control for Virtual Synchronous Machine based on Adaptive Dynamic Programming 1998**
Naresh Malla, Dipesh Shrestha, Zhen Ni and Reinaldo Tonkoski
Electrical Engineering and Computer Science Department, South Dakota State University, Brookings, SD 57007, USA.
- 4:50PM** **E-16937** **Smart Renewable Energy Management System for Consumer Applications 2006**
Justin Schlauwiz¹ and Petr Musilek^{1,2}
¹*Department of Electrical and Computer Engineering, University of Alberta, Edmonton AB, Canada;* ²*Faculty of Electrical Engineering and Computer Science, VSB-Technical University, Ostrava, Czech Republic*
- 5:10PM** **E-16906** **A Hybrid Meta-heuristic Method for Unit Commitment Considering Flexible Charging and Discharging of Plug-in Electric Vehicles 2014**
Zhile Yang, Kang Li and Xiandong Xu
School of Electronics, Electrical, Engineering and Computer Science, Queen's University Belfast, Belfast, BT9 5AH, UK
- 5:30PM** **E-16521** **Integrating Demand Response into Electricity Market 2021**
Zixu Liu, Xiao-Jun Zeng and Qian Ma
School of computer Science, University of Manchester, Manchester, UK.
- 5:50PM** **E-16046** **Implementation of Demand Side Management of a Smart Home using Multi-Agent System 2028**
Weixian Li¹, T. Logenthiran¹, W. L. Woo¹, Van-Tung Phan¹ and D. Srinivasan²
¹*School of EEE, Newcastle University, Singapore;* ²*Department of ECE, National University of Singapore.*
- 6:10PM** **E-16992** **Artificial Bee Colonies Based Optimal Sizing of Microgrid Components: A Profit Maximization Approach 2036**
Lucio Ciabattoni, Francesco Ferracuti, Gianluca Ippoliti and Sauro Longhi
Dipartimento di Ingegneria dell'Informazione, Universita' Politecnica delle Marche, Ancona, Italy.

Session WA-12	Particle Swarm Optimization
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 202
Chair	Zhi-Hui Zhan / Toshiharu Hatanaka

- 8:00AM E-17160 Adaptive Radius Species Based Particle Swarm Optimization for Multimodal Optimization Problems 2043**
Zhi-Hui Zhan¹, Zi-Jia Wang¹, Ying Lin² and Jun Zhang³
¹*School of Computer Science and Engineering, South China University of Technology, 510006 Guangzhou, P.R. China;* ²*School of Data and Computer Science, Sun Yat-Sen University, Guangzhou, 510275, China;* ³*Department of Psychology, Sun Yat-Sen University, Guangzhou, 510275, China*
- 8:20AM E-16412 A Refinement Mechanism to Improve Particle Swarm Optimization 2049**
Wei Ren Tan, Saúl Zapotecas-Martínez, Hernán E. Aguirre and Kiyoshi Tanaka
Faculty of Engineering, Shinshu University, 4-17-1 Wakasato, Nagano 380-8553, Japan.
- 8:40AM E-16181 Comparison of Differential Grouping and Random Grouping Methods on ϵ CCPSO for Large-Scale Constrained Optimization 2057**
Chen Peng and Qing Hui
Department of Electrical and Computer Engineering, University of Nebraska-Lincoln, Lincoln NE, 68588--0511, USA.
- 9:00AM E-16858 Multi-Objective Random Drift Particle Swarm Optimization Algorithm with Adaptive Grids 2064**
Yiqiong Yuan¹, Jun Sun² and Dongmei Zhou¹
¹*School of IoT Engineering, Jiangnan University, Wuxi, Jiangsu, 214122, China;* ²*Key Laboratory of Advanced Process Control for Light Industry (Ministry of Education), Jiangnan University, Wuxi, Jiangsu, 214122, China.*
- 9:20AM E-26049 Histogram Particle Swarm Optimization (HistPSO): Evolving Non-Parametric Acceleration Distributions 2071**
Joshua M. Manela¹ and Timothy C. Havens^{1,2}
¹*Department of Electrical and Computer Engineering, Michigan Technological University, Houghton, Michigan, 49931, USA;* ²*Department of Computer Science, Michigan Technological University, Houghton, Michigan, 49931, USA.*
- 9:40AM E-17038 Heterogenous Swarm with First and Second Order Dynamics for Function Optimization 2077**
Heng Xiao and Toshiharu Hatanaka
Graduate School of Information Science and Technology, Osaka University, Suita, Japan.

Session WA-13	Genetic Algorithms
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 203
Chair	Walter Krawec / Debora Medeiros

- 8:00AM E-16962 An Integrated Prognostic based Hybrid Genetic-Immune Algorithm for scheduling jobs and predictive maintenance 2083**
Asma Ladj¹, Fatima Benbouzid-Si Tayeb¹ and Christophe Varnier²
¹Ecole nationale Supérieure d'Informatique ESI, Laboratoire de Méthodes de Conception de Systèmes, Algiers, Algeria; ²Institut Femto-St, Dept AS2M, Besançon, France.
- 8:20AM E-16731 A Genetic Algorithm for Deploying Roadside Units in VANETs 2090**
João F. M. Sarubbi¹, Flávio V. C. Martins¹ and Cristiano M. Silva²
¹Computer Department, CEFET-MG, Belo Horizonte — MG — Brazil;
²Technology Department, UFSJ, Ouro Branco — MG — Brazil.
- 8:40AM E-16067 A Genetic Algorithm to Analyze the Security of Quantum Cryptographic Protocols 2090**
Walter O. Krawec
Computer Science Department, Iona College, New Rochelle, NY, 10801, USA.
- 9:00AM E-17022 FCFilter: Feature Selection based on Clustering and Genetic Algorithms 2106**
Charles H. P. Ferreira¹, Debora M. R. de Medeiros¹ and Fabiana Santana²
¹Center of Mathematics, Computation & Cognition, Federal University of ABC (UFABC), Brazil; ²Faculty of Education, Science, Technology & Mathematics, University of Canberra, Australia.
- 9:20AM E-17062 Novel Crossover and Mutation Operation in Genetic Algorithm for Clustering 2114**
A. H. Beg and Md Zahidul Islam
School of Computing and Mathematics, Charles Sturt University, Panorama Avenue, Bathurst 2795, Australia.
- 9:40AM E-16995 Genetic Algorithms based on a Granular Surrogate Model and Fuzzy Aptitude Functions 2122**
Israel Cruz-Vega¹, Carlos Alberto Reyes García², Pilar Gómez Gil², Juan Manuel Ramírez Cortés³ and José de Jesús Rangel Magdaleno³
¹CONACYT Research Fellow, Instituto Nacional de Astrofísica, Óptica y Electrónica Electronics Department, Sta. María Tonantzintla, Puebla, 72840, Mexico; ²Instituto Nacional de Astrofísica, Óptica y Electrónica, Computer Science Department; ³Instituto Nacional de Astrofísica, Óptica y Electrónica, Electronics Department, Mexico.

Session WA-14	Multi-objective Evolutionary Algorithms
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 204
Chair	Xianpeng Wang / Shengxiang Yang

- 8:00AM E-16114 A Multi-objective Differential Evolution Algorithm with Memory Based Population Construction 2129**
Xianpeng Wang^{1,2}, Zhiming Dong^{1,2} and Lixin Tang¹
¹*Institute of Industrial Engineering & Logistics Optimization;* ²*State Key Laboratory of Synthetical Automation for Process Industries, Northeastern University, Shenyang, China*
- 8:20AM E-16882 A Meta-Heuristic Approach to Predict Protein-Protein Interaction Network 2137**
Archana Chowdhury¹, Pratyusha Rakshit¹, Amit Konar¹ and Atulya K. Nagar²
¹*Department of Electronics & Telecommunication Engineering, Jadavpur University, Kolkata, India;* ²*Department of Math and Computer Science, Liverpool Hope University, Liverpool, UK.*
- 8:40AM E-16414 An Adaptive Penalty-based Boundary Intersection Approach for Multiobjective Evolutionary Algorithm Based on Decomposition 2145**
Shouyong Jiang¹, Shengxiang Yang¹ and Jinglei Guo²
¹*School of Computer Science, De Montfort University, UK;* ²*Department of Computer Science, Central China Normal University, China.*
- 9:00AM E-16534 Improved Adaptive Global Replacement Scheme for MOEA/D-AGR 2153**
Hiu-Hin Tam¹, Man-Fai Leung¹, Zhenkun Wang³, Sin-Chun Ng¹, Chi-Chung Cheung² and Andrew K. Lui¹
¹*School of Science and Technology, The Open University of Hong Kong, Hong Kong;* ²*Department of Electronic and Information Engineering, The Hong Kong Polytechnic University, Hong Kong;* ³*School of Electronic Engineering, Xidian University, Xi'an, Shanxi Province, China.*
- 9:20AM E-17100 A Two-phase Many-Objective Evolutionary Algorithm with Penalty Based Adjustment for Reference Lines 2161**
Chunyang Zhu¹, Xinye Cai¹, Zhun Fan² and Muhammad Sulaman¹
¹*School of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics, Jiangsu, China;* ²*School of Engineering, Shantou University, Guangdong, China.*
- 9:40AM E-16597 A Cone Order Sequence based Multi-objective Evolutionary Algorithm 2169**
Yueming Lyu, Qingfu Zhang and Ka-Chun Wong
Department of Computer Science, City University of Hong Kong, Tat Chee Avenue, Hong Kong SAR.

Session WA-15	SS CEC-31: New Directions in Evolutionary Machine Learning
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 205
Chair	Will Browne / Yusuke Nojima

- 8:00AM E-17147 Integration of Code-Fragment based Learning Classifier Systems for Multiple Domain Perception and Learning 2177**
 Yi Liu, Muhammad Iqbal, Isidro Alvarez and Will N. Browne
School of Engineering and Computer Science, Victoria University of Wellington, PO Box 600, Wellington 6140, New Zealand.
- 8:20AM E-16947 Evolutionary Support Vector Machines: A Dual Approach 2185**
 Madson Luiz Dantas Dias and Ajalmar R. Rocha Neto
Department of Teleinformatics, Federal Institute of Ceará Fortaleza, 60040-215, Ceará, Brazil.
- 8:40AM E-17190 Effects of Parallel Distributed Implementation on the Search Performance of Pittsburgh-style Genetics-based Machine Learning Algorithms 2193**
 Yusuke Nojima and Hisao Ishibuchi
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.
- 9:00AM E-17173 A Comprehensive Strategy for Mammogram Image Classification using Learning Classifier Systems 2201**
 Abubakar Siddique¹, Muhammad Iqbal² and Will N. Browne²
¹*Science and Technology Unit, Umm Al Qura University, Makkah 21955, Saudi Arabia;* ²*School of Engineering and Computer Science, Victoria University of Wellington, Wellington 6140, New Zealand.*
- 9:20AM E-16957 Adapting Learning Classifier Systems to Symbolic Regression 2209**
 Syed S. Naqvi and Will N. Browne
Victoria University of Wellington, New Zealand.
- 9:40AM E-16183 Compaction for Code Fragment Based Learning Classifier Systems — Redux 2217**
 Isidro M. Alvarez, Will N. Browne and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.

Session WA-16	SS CEC-25B: Bat Algorithm and Cuckoo Search
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 206
Chair	Xin-She Yang / Ling Wang

- 8:00AM** **E-16746** **Adjusted Bat Algorithm for Tuning of Support Vector Machine Parameters 2225**
Eva Tuba¹, Milan Tuba¹ and Dana Simian²
¹*Faculty of Computer Science, John Naisbitt University, Belgrade, Serbia;*
²*Faculty of Science, Lucian Blaga University, Sibiu, Romania.*
- 8:20AM** **E-16128** **Community Detection in Graphs based on Surprise Maximization using Firefly Heuristics 2233**
Javier Del Ser^{1,2}, Jesus L. Lobo¹, Esther Villar-Rodriguez¹, Miren Nekane Bilbao² and Cristina Perfecto²
¹*TECNALIA RESEARCH & INNOVATION, 48160 Zamudio, Bizkaia, Spain;*
²*University of the Basque Country UPV/EHU, Bilbao, Bizkaia, Spain.*
- 8:40AM** **E-16206** **A Hybrid Discrete Cuckoo Search for Distributed Permutation Flowshop Scheduling Problem 2240**
Jingjing Wang, Ling Wang and Jingnan Shen
Department of Automation, Tsinghua University, Beijing, 100084, China.
- 9:00AM** **E-16956** **Cuckoo Search with Lévy Flights for Reconstruction of Outline Curves of Computer Fonts with Rational Bézier Curves 2247**
Andrés Iglesias^{1,2}, Akemi Gálvez¹
¹*Department of Applied Mathematics & Computer Science, E.T.S.I. Caminos, Canales y Puertos, Universidad de Cantabria, Avda. de los Castros, s/n, 39005, Santander, Spain;* ²*Department of Information Science, Faculty of Sciences, Narashino Campus, Toho University, 2-2-1 Miyama, 274-8510, Funabashi, Japan*
- 9:20AM** **E-16745** **Modified Firefly Algorithm Using Randomized Mechanisms 2255**
Li_Na Zhang¹, Li_Qiang Liu¹, Gan_Nan Yuan¹ and Yun_Tao Dai²
¹*College of Automation, Harbin Engineering University, Harbin, China;*
²*College of Science, Harbin Engineering University, Harbin, China*

Session WA-17	SS CEC-36A: Evolutionary Computation in Architectural Design
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 207
Chair	Fatih Tasgetiren / Cemre Cubukcuoglu

- 8:00AM E-16616 Computational Cognitive Color Perception 2262**
 Özer Ciftcioglu¹ and Michael S. Bittermann²
¹*Department of Architecture, Delft University of Technology, The Netherlands, Maltepe University, Maltepe — Istanbul, Turkey;* ²*Department of Architecture, Maltepe University, Maltepe-Istanbul, Turkey.*
- 8:20AM E-16240 A Multi-Objective Self-Adaptive Differential Evolution Algorithm for Conceptual High-Rise Building Design 2272**
 Berk Ekici¹, Ioannis Chatzikonstantinou¹, Sevil Sariyildiz¹, M. Fatih Tasgetiren² and Quan – Ke Pan³
¹*Yasar University, TU Delft, Department of Architecture, Chair of Design Informatics, Izmir, Turkey, Delft, The Netherlands;* ²*Yasar University, Department of Industrial Engineering, Izmir, Turkey;* ³*State Key Laboratory, Huazhong University of Science and Technology, Wuhan, P.R. China.*
- 8:40AM E-16249 Multi-Objective Harmony Search Algorithm for Layout Design in Theatre Hall Acoustics 2280**
 Cemre Cubukcuoglu¹, Ayca Kirimtat², M. Fatih Tasgetiren³, P. N. Suganthan⁴ and Quan-Ke Pan⁵
¹*Yasar University, Department of Interior Architecture, Izmir, Turkey;* ²*Yasar University, Department of Architecture, Izmir, Turkey;* ³*Yasar University, Department of Industrial Engineering, Izmir, Turkey;* ⁴*Nanyang Technological University, School of Electrical and Electronic Engineering, Singapore;* ⁵*State Key Laboratory, Huazhong University of Science and Technology, Wuhan, P.R. China.*
- 9:00AM E-16489 Multi-Objective Optimization Through Differential Evolution for Restaurant Design 2288**
 Cemre Cubukcuoglu¹, Ioannis Chatzikonstantinou², Berk Ekici³, Sevil Sariyildiz⁴ and M. Fatih Tasgetiren⁵
¹*Yasar University Interior Architecture, Izmir, Turkey;* ²*Yasar University, Architecture TU Delft, Design Informatics Izmir, Turkey & Delft, Holland;* ³*Yasar University Architecture, Izmir, Turkey;* ⁴*Yasar University, Architecture TU Delft, Design Informatics Izmir, Turkey & Delft, Holland;* ⁵*Yasar University Industrial Engineering, Izmir, Turkey.*
- 9:20AM E-16620 Precision Constrained Optimization by Exponential Ranking 2296**
 Michael S. Bittermann¹ and Özer Ciftcioglu²
¹*Department of Architecture, Maltepe University, Turkey;* ²*Department of Architecture, Delft University of Technology, The Netherlands, Maltepe University, Maltepe — Istanbul, Turkey.*
- 9:40AM E-17016 Interior Spatial Layout with Soft Objectives using Evolutionary Computation 2306**
 Ioannis Chatzikonstantinou¹ and Ebru Bengisu²
¹*Faculty of Architecture, Yaşar University, Izmir, Turkey and Department of Building Technology, Faculty of Architecture, TU Delft, Delft, The Netherlands;* ²*Faculty of Interior Architecture and Environmental Design, Yaşar University, Izmir, Turkey.*

Session WA-18	SS CDCI-10: Computational Intelligence Methodologies for Environmental Sustainability and Sustainable Development: Theory and Applications / SS CDCI-16: Computational Intelligence in Dynamics of Complex Networks: Models and Applications
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 208+209
Chair	Tatiana Tambouratzis / Chung-Ming Ou

- 8:00AM E-16250 A Decision Making Support Tool: The Resilience Management Fuzzy Controller 2313**
 J. Rubén G. Cárdenas¹, Àngela Nebot², Francisco Mugica² and Alfredo Vellido²
¹IUSS UME School Via Ferrata 45, Pavia, Italy; ²Soft Computing Group, Technical University of Catalonia, Jordi Girona Salgado 1-3, Barcelona, Spain.
- 8:20AM E-16438 Predicting Sea Waves in the Presence of Pink Noise 2321**
 Jacqueline Christmas
 Computer Science Department, University of Exeter, Exeter, EX4 4QF, UK.
- 8:40AM E-16997 A Step-Wise Genetic-Algorithm-Based Approach for Improving the Sustainability of any Country and for Determining the Characteristics of the Ideally Sustainable Country 2329**
 Tatiana Tambouratzis Fima
 Department of Industrial Management & Technology, University of Piraeus, 107 Deligiorgi St, Piraeus, 185 34, Greece.
- 9:00AM E-16609 Automatic Inference of Graph Models for Directed Complex Networks using Genetic Programming 2337**
 Michael Richard Medland¹, Kyle Robert Harrison² and Beatrice M. Ombuki-Berman¹
¹Department of Computer Science, Brock University, St. Catharines, ON, Canada; ²Department of Computer Science, University of Pretoria, Pretoria, South Africa.
- 9:20AM E-16065 An Effective Method to Find the k Shortest Paths in a Generalized Time-Window Network 2345**
 Xiao-Bing Hu¹, Ming-Kong Zhang¹, Jian-Qin Liao² and Hai-Lin Zhang³
¹Academy of Disaster Reduction and Emergence, Management, Beijing Normal University, Beijing, China; ²Chengdu MiidShare Technology Ltd, Chengdu, China; ³Research Institute of Highway, Ministry of Transport, Beijing, China
- 9:40AM E-16531 Minimize the Average Mean First Passage Time of Random Walk in Complex Networks by Genetic Algorithm 2352**
 Yue Yu and Kwok Yip Szeto
 Department of Physics, Hong Kong University of Science and Technology, Hong Kong, China.

Session	[Plenary] – Evolutionary Optimization of Complex Systems and Data Driven Evolutionary Optimization, Prof. Yaochu Jin
Date/Time	Wednesday, 27 July 2016 / 1:00PM – 2:00PM
Venue	Room Ballroom C
Chair	Sanaz Mostaghim

Session	Poster – CEC Poster Session
Date/Time	Wednesday, 27 July 2016 / 2:00PM – 6:00PM
Venue	Room Ballroom D
Chair	Laszlo Kockzy

- P301** **E-16251** **An Extension of the ACO_R Algorithms with Time-Decaying Search Width, with Application to Neural Network Training** 2360
 Ashraf M. Abdelbar¹ and Khalid M. Salama²
¹*Department of Mathematics & Computer Science, Brandon, Manitoba, Canada;* ²*School of Computing, University of Kent Canterbury, United Kingdom.*
- P302** **E-16456** **A Hybrid Differential Evolutionary Algorithm Based on the Hierarchical Clustering** 2367
 Zheng Fang¹, Ming Yang¹, Guilin Zhang¹ and Jing Guan²
¹*School of Computer Science, China University of Geosciences, Wuhan, 430074, China;* ²*China Ship Development and Design Center, Wuhan, 430064, China.*
- P303** **E-16314** **A Novel Registration Method based on Coevolutionary Strategy** 2375
 Jun Zhang¹ and Jinglu Hu²
¹*Information, Production and Systems Research Center, Waseda University, Japan;* ²*Graduate School of Information, Production and Systems, Waseda University, Japan.*
- P304** **E-16241** **Development of a Genetic Programming-based GA Methodology for the Prediction of Short-to-Medium-term Stock Markets** 2381
 Manal Alghieth, Yingjie Yang and Francisco Chiclana
Centre for Computational Intelligence, Faculty of Technology, De Montfort University, Leicester, UK
- P305** **E-17015** **A construction of rotations-based rosters with a Genetic Algorithm** 2389
 Chaima Boufaied, Raja Trabelsi, Hela Masri and Saoussen Krichen
LARODEC Laboratory, Department of Computer Science, Higher Institute of Management, University of Tunisia, Tunisia.
- P306** **E-16901** **A Fuzzy Genetic Algorithm Approach to Generate and Assess Meta-Architectures for Non-Line of Site Fires Battlefield Capability** 2395
 Gene Lesinski¹, Steven M. Corns¹ and Cihan H. Dagli²
¹*Department of Systems Engineering, United States Military Academy, West Point, NY, USA;* ²*Engineering Management and Systems Engineering Department, Missouri University of Science and Technology, Rolla, MO, USA.*

- P307** **E-16235** **Decision Template Multi-label Classification based on Recursive Dependent Binary Relevance 2402**
 Thomas W. Rauber, Victor F. Rocha, Lucas H. S. Mello and Flávio M. Varejão
Departamento de Informática, Centro Tecnológico, Universidade Federal do Espírito Santo, 29060-970 Vitória, Brazil.
- P308** **E-16561** **Complexity measures in Genetic Programming Learning: A Brief Review 2409**
 Nam Le¹, Hoai Nguyen Xuan¹, Anthony Brabazon² and Thuong Pham Thi¹
¹Hanu IT Research and Development Center, Hanoi University; ²University College Dublin, Ireland.
- P309** **E-16022** **Feature Selection and Classification Using Age Layered Population Structure Genetic Programming 2417**
 Anthony Awuley and Brian J. Ross
Department of Computer Science, Brock University, St. Catharines, ON, L2S 3A1, Canada.
- P310** **E-16301** **ICARUS: Identification of Complementary algoRithms by Uncovered Sets 2427**
 Mario A. Muñoz¹ and Michael Kirley²
¹School of Mathematical Sciences, Monash University, Clayton, VIC, Australia; ²Department of Computer and Information Systems, The University of Melbourne, Parkville, VIC, Australia.
- P311** **E-16728** **The Distributed Permutation Flowshop Scheduling Problem with Different Transport Timetables and Loading Capacities 2433**
 ZhengYang Li, WenZhe Duan, MengChen Ji, YiXin Yang, ShouYang Wang and Bo Liu
Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China.
- P312** **E-16722** **Strategic Planning of Aircraft Trajectories in North Atlantic Oceanic Airspace Based on Flocking Behaviour 2438**
 Imen Dhief^{1,2}, Nour Houda Dougui¹, Daniel Delahaye² and Noureddine Hamdi¹
¹Heterogeneous Advanced Networking and Applications (HANA) Research Group ENSI, Manouba University Campus, 2010 Manouba, Tunisia; ²Laboratory of Applied Mathematics, Informatics and Automatics for Aviation (MAIAA) ENAC, 7 avenue Edouard Belin, 31055, Toulouse, France
- P313** **E-16280** **A Fuzzy C-Means Clustering Based Tournament Selection for Multiobjective Optimization 2446**
 Zhang Yi¹, Yu Zhen¹, Li Zi-mu¹ and Lu Tong-tong²
¹College of Mechanical & Power Engineering, China Three Gorges University, Yi Chang, China; ²College of Economy & Management, China Three Gorges University, Yi Chang, China.
- P314** **E-16477** **Multimodal Multi-objective Optimization: A Preliminary Study 2454**
 J. J. Liang¹, C. T. Yue¹ and B. Y. Qu²
¹School of Electrical Engineering, Zhengzhou University, Zhengzhou, 450001, China; ²School of Electronic and Information Engineering, Zhongyuan University of Technology, Zhengzhou, 450007, China.

- P315** **E-16538** **Reference Point-based Nondominated Sorting Multi-objective Quantum-inspired Evolutionary Algorithm** 2462
Dick Sigmund and Jong-Hwan Kim
School of Electrical Engineering, KAIST, Daejeon, Republic of Korea.
- P316** **E-16811** **An Objective Reduction Algorithm Based on Hyperplane Approximation for Many-Objective Optimization Problems** 2470
Yifan Li, Hai-Lin Liu and Fangqing Gu
Guangdong University of Technology, Guangzhou, China.
- P317** **E-16148** **A Comparative Study on Decomposition-Based Multi-objective Evolutionary Algorithms for Many-Objective Optimization** 2477
Xiaoliang Ma, Junshan Yang, Nuosi Wu, Zhen Ji and Zexuan Zhu
Shenzhen City Key Laboratory of Embedded System Design, College of Computer Science and Software Engineering, Shenzhen University, Shenzhen, China.
- P318** **E-16310** **A Decomposition Based Evolutionary Algorithm with Uniform Design for Multi-objective Optimization** 2484
Cai Dai, Xiujian Lei and Yulian Ding
College of Computer Science, Shaanxi Normal University, Xi'an, 710062, China.
- P319** **E-17037** **High Dimensional Model Representation for Solving Expensive Multi-Objective Optimization Problems** 2490
Proteek Chandan Roy and Kalyanmoy Deb
Department of Computer Science and Engineering, Michigan State University, 1220 Trowbridge Rd, East Lansing, Michigan-48824, USA.
- P320** **E-16282** **Prediction of Pareto Dominance by Reducing Equivalent and Redundant Dimensions in Decision Vectors** 2498
Guanqi Guo, Caiying Feng, Wenbin Li and Bo Yang
College of Information & Communication Engineering, Hunan Institute of Science & Technology, Yueyang, China.
- P321** **E-16436** **Running Krill Herd Algorithm on Hadoop: A Performance Study** 2504
Simone A. Ludwig
North Dakota State University, Fargo, ND, USA.
- P322** **E-16136** **A Novel Constrained Bare-bones Particle Swarm Optimization** 2511
Yuanxia Shen^{1,2}, Jian Chen¹, Chuanhua Zeng² and Bin Ji¹
¹School of Computer Science and Technology, Anhui University of Technology, Maanshan, China; ²School of Mathematics & Physics, Anhui University of Technology, Maanshan, 243002, China
- P323** **E-16624** **PSO+: A Nonlinear Constraints-Handling Particle Swarm Optimization** 2518
Manoela Kohler, Leonardo Forero, Marley Vellasco, Ricardo Tanscheit and Marco Aurélio Pacheco
Department of Electrical Engineering, Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, Brazil.

- P324** **E-16407** **Search Experience-Based Search Adaptation in Artificial Bee Colony Algorithm 2524**
 Xianneng Li¹, Guangfei Yang¹ and Mustafa Servet Kiran²
¹Faculty of Management and Economics, Dalian University of Technology, China; ²Department of Computer Engineering, Faculty of Engineering, University of Selcuk, Turkey.
- P325** **E-16461** **Research on Autonomous Moving Robot Path Planning Based on Improved Particle Swarm Optimization 2532**
 Zhibin Nie¹, Xiaobing Yang¹, Shihong Gao^{1,2}, Yan Zheng¹, Jianhui Wang¹ and, Zhanshan Wang¹
¹School of Information Science & Engineering, Northeastern University, Shenyang, China; ²Shanxi University, Taiyuan, China.
- P326** **E-16107** **Multi-context Cooperative Coevolution in Particle Swarm Optimization 2537**
 Ruo-li Tang¹, Zhou Wu² and Yan-jun Fang¹
¹Department of Automation, Wuhan University, Wuhan, China; ²Department of Electrical Electronic Computer Engineering, University of Pretoria, Pretoria, South Africa.
- P327** **E-16559** **Finite-time Analysis of the Multi-armed Bandit Problem with Known Trend 2543**
 Djallel Bouneffouf
 Canada's Michael Smith Genome Sciences Centre, University of British Columbia, Vancouver, British Columbia, Canada.
- P328** **E-16038** **Differential Evolution with Multi-Stage Strategies for Global Optimization 2550**
 Xiao-Gen Zhou, Gui-Jun Zhang, Xiao-Hu Hao, Li Yu and Dong-Wei Xu
 College of Information Engineering, Zhejiang University of Technology, Hangzhou, Zhejiang, P.R. China.
- P329** **E-16162** **A Study of Fitness Functions for Reconstructing Networks using Node Degrees 2558**
 Martin O. Wimmers¹ and Jing Liu²
¹School of International Education, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, Xi'an, 710071, China; ²Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, Xi'an, 710071, China
- P330** **E-16055** **Entropy Determined Hybrid Two-Stage Multi-Objective Evolutionary Algorithm Combining Locally Linear Embedding 2565**
 Liang Chen, Chong Zhou, Guangming Dai, Yuzhen Zhang and Ruixue Hu
 School of Computer, China University of Geosciences, Wuhan, 430074, China and Hubei Key Laboratory of Intelligent Geo-Information Processing, China University of Geosciences, Wuhan, 430074, China.
- P331** **E-16851** **Adaptive Patch-Based Sparsity Estimation for Image via MOEA/D 2573**
 Yu Zhou, Sam Kwong^{1,2}, Qingfu Zhang^{1,2} and Mengyuan Wu¹
¹Department of Computer Science, City University of Hong Kong, Kowloon, Hong Kong; ²Shenzhen Research Institute, City University of Hong Kong, Shenzhen, China

- P332** **E-16693** **A Hybrid Estimation of Distribution Algorithm for Distributed Permutation Flowshop Scheduling with Flowline Eligibility** 2581
Wenzhe Duan, Zhengyang Li, Mengchen Ji, Yixin Yang, Shouyang Wang and Bo Liu
Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing 100190, China.
- P333** **E-16721** **Physical Construction of Local Design Information for Sounding Hybrid Rocket Design via Correlation-based Information Hierarchical Structure** 2588
Kazuhiisa Chiba¹, Shinya Watanabe² and Masahiro Kanazaki³
¹*Graduate School of Informatics and Engineering, The University of Electro-Communications, Tokyo, 182-8585, Japan;* ²*College of Information and Systems, Muroran Institute of Technology, Hokkaido, 050-8585, Japan;* ³*Graduate School of System Design, Tokyo Metropolitan University, Tokyo, 191-0065, Japan*
- P334** **E-16692** **Image Restoration by Multivariate-Stochastic Optimization using Improved Particle Swarm Algorithm** 2596
Mohsin Bilal¹, Mudasser F. Wyne² and Muhammad Arfan Jaffar³
¹*College of Computer & Information Systems, Makkah Al Mukarrama, Saudi Arabia;* ²*School of Engineering and Computing, National University, San Diego, USA;* ³*College of Computer & Information Systems, Al Imam Mohammad Ibn Saud Islamic University, (IMSIU), Riyadh, Saudi Arabia.*
- P335** **E-16029** **Improving the Computational Efficiency of Ripple-Spreading Algorithm for the k Shortest Paths Problem** 2604
Xiao-Bing Hu¹, Ming-Kong Zhang¹ and Di Hu²
¹*Academy of Disaster Reduction and Emergence, Management, Beijing Normal University, Beijing, China;* ²*School of Statistics, Central University of Finance and Economics, Beijing, China.*
- P336** **E-16686** **An Ensemble of Differential Evolution Algorithms with Variable Neighborhood Search for Constrained Function Optimization** 2610
Mert Paldrak¹, M. Fatih Tasgetiren¹, P. N. Suganthan² and Quan-Ke Pan³
¹*Yasar University, Department of Industrial Engineering, Izmir, Turkey;* ²*Nanyang Technological University School of Electrical and Electronic Engineering, Singapore;* ³*State Key Laboratory, Huazhong University of Science and Technology, Wuhan, P.R. China.*
- P337** **E-16623** **Tiled EvoLisa Image Evolution With Blending Triangle Brushstrokes and Gene Compression DE** 2618
Aleš Zamuda and Uroš Mlakar
Faculty of Electrical Engineering and Computer Science, University of Maribor, Smetanova ul. 17, 2000 Maribor, Slovenia.
- P338** **E-16236** **An Effective Estimation of Distribution Algorithm for Solving Uniform Parallel Machine Scheduling Problem with Precedence Constraints** 2626
Chu-ge Wu, Ling Wang and Xiao-long Zheng
Department of Automation, Tsinghua University, Beijing, China.

- P339** **E-17042** **A New Computationally Efficient Dynamic Scheduling for Multiple Resource Constrained Procedures 2633**
 Mohammadali Shahriari¹, Mohammad Biglarbegian¹, William Melek² and Joseph Kurian³
¹University of Guelph, Guelph, Canada; ²University of Waterloo, Waterloo, Canada; ³Alpha-IT, Toronto, Canada.
- P340** **E-16825** **A Contribution-guided Discrete Differential Evolution Algorithm for the Quadratic Multiple Knapsack Problem 2641**
 Xiangling Zhao, Yun Dong and Lixin Tang
 Institute of Industrial Engineering & Logistics Optimization, Northeastern University, Shenyang, China.
- P341** **E-16689** **Scheduling of No-wait Stochastic Distributed Assembly Flowshop by Hybrid PSO 2649**
 Mengchen Ji, Yixin Yang, Wenzhe Duan, Shouyang Wang and Bo Liu
 Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, 100190, China.
- P342** **E-16081** **Global Optimisation of Multiple Gravity Assist Spacecraft Trajectories Based on Search Space Exploring and PCA 2655**
 Mingcheng Zuo, Guangming Dai, Lei Peng, Liang Chen, Xiaoyu Chen and Zhiming Song
 School of Computer Science, China University of Geosciences, Wuhan, China
- P343** **E-16172** **Optimal Sliding Mode Control for Spacecraft Rendezvous with Collision Avoidance 2661**
 Licheng Feng, Qing Ni, Yuzhu Bai, Xiaoqian Chen and Yong Zhao
 College of Aerospace Science and Engineering, National University of Defense Technology, Changsha, Hunan, China
- P344** **E-16311** **Application of Multi-Objective Alliance Algorithm to Multidisciplinary Design Optimization under Uncertainty 2669**
 Xiaoqian Chen¹, Xingzhi Hu¹, Valerio Lattarulo², Wen Yao¹ and Yong Zhao¹
¹College of Aerospace Science and Engineering, National University of Defense Technology, Changsha, China; ²Department of Engineering, University of Cambridge, Cambridge, United Kingdom.
- P345** **E-16528** **Human-computer Cooperative Brain Storm Optimization Algorithm for the Two-echelon Vehicle Routing Problem 2676**
 Xueming Yan¹, Zhifeng Hao², Han Huang³ and Gang Li⁴
¹School of Computer Science and Engineering, South China University of Technology, Guangzhou, China; ²School of Mathematics and Big Data, Foshan University, Foshan, China; ³School of Software Engineering, South China University of Technology, Guangzhou, 510006, China; ⁴School of Computer and Engineering, South China University of Technology, Guangzhou, China
- P346** **E-16522** **Brain Storm Optimization Algorithm with Re-initialized Ideas and Adaptive Step Size 2682**
 Mohammed El-Abd
 Electrical and Computer Engineering Department, American University of Kuwait, Salmiya, Kuwait.

- P347** **E-16725** **State-Space Modeling and Offline Evolutive Parameter Estimation of a Generic Robotic Platform 2687**
Leonardo B Farconi, Ecyo Farias, Jose Montandon, Pedro Rogerio de P. Guimaraes, Nuno B. Barcellos, Leonardo C. Ramos, Rafael G. Lang, Ivan N da Silva and Roseli A. F. Romero
Warthog Robotics Sao Carlos School of Engineering (EESC) and Institute of Mathematics and Computer Science (ICMC), University of Sao Paulo (USP), Sao Carlos — SP, 13566-590, Brazil.
- P348** **E-16146** **Application of Simplified Swarm Optimization Algorithm in Deteriorate Supply Chain Network Problem 2695**
Wei-Chang Yeh¹, Wei-Ting Lin¹, Chyh-Ming Lai¹, Yen-Chin Lee¹, Yuk Ying Chung² and Jsen-Shung Lin³
¹*Department of IEEM, National Tsing Hua University, Hsinchu, Taiwan;*
²*School of Information Technology, University of Sydney, NSW, Australia;*
³*Department of Information Management, Central Police University, Taoyuan, Taiwan*
- P349** **E-16225** **Integrated use of Soft Computing and Clustering for Capacitated Clustering Single-Facility Location Problem with One-Time Delivery 2701**
Yunzhi Jiang¹, Wei-Chang Yeh², Chyh-Ming Lai², Hsiu-Hao Liu², Che-Hou Yeh², Yuk Ying Chung³ and Jsen-Shung Lin⁴
¹*School of Automation, Guangdong Polytechnic Normal University, Guangdong, China;* ²*Department of IEEM, National Tsing Hua University, Hsinchu, Taiwan;* ³*School of Information, Technology University of Sydney, NSW, Australia;* ⁴*Department of Information, Management Central Police University, Taoyuan, Taiwan*
- P350** **E-16567** **A Multi-agent Genetic Algorithm based on Natural Coding for Emergency Resources Scheduling Problems 2706**
Haolong Wu and Jing Liu
Key Laboratory of Intelligent Perception and Image, Understanding of Ministry of Education, Xidian University Xi'an 710071, China.
- P351** **E-16202** **An Superior Tracking Artificial Bee Colony for Global Optimization Problems 2712**
Xianghua Chu¹, Guozheng Hu¹, Ben Niu¹, Li Li¹ and Zhengrong Chu²
¹*College of Management, Shenzhen University, Shenzhen, China;* ²*Department of Mechanical Engineering, University of Manitoba, Winnipeg, Canada*
- P352** **E-16674** **A Shuffled Complex Evolution Algorithm for the Multidimensional Knapsack Problem Using Core Concept 2718**
Marcos Daniel Valadão Baroni and Flávio Miguel Varejão
Departamento de Informática, Universidade Federal do Espírito Santo, Vitória, Espírito Santo, Brazil.

- P353** **E-16413** **Clustering using Flower Pollination Algorithm and Calinski-Harabasz Index 2724**
 Szymon Łukasik^{1,2}, Piotr A. Kowalski^{1,2}, Małgorzata Charytanowicz^{2,3} and Piotr Kulczycki^{1,2}
¹*Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, al. Mickiewicza 30, 30-059 Kraków, Poland;*
²*Systems Research Institute, Polish Academy of Sciences, ul. Newelska 6, 01-447 Warsaw, Poland;* ³*Institute of Mathematics and Computer Science, The John Paul II Catholic University of Lublin, Konstantynów 1 H, 20-708 Lublin, Poland.*
- P354** **E-16807** **Knowledge-inducing MOEA/D for Interval Multi-objective Optimization Problems 2729**
 Yi-nan Guo, Jian Cheng, Zhen Yang and Chun Wang
School of Information and Electrical Engineering, China University of Mining and Technology, Xuzhou, China.
- P355** **E-17072** **A Multi-point Local Search Algorithm for Continuous Dynamic Optimization 2736**
 Xin Yu and Xi Wu
School of Computer Science, Chengdu University, of Information Technology, Chengdu, Sichuan 610225, China.
- P356** **E-16223** **An Improved Artificial Immune Network Algorithm for Data Clustering Based on Secondary Competition Selection 2744**
 Yangyang Li, Dong Wang, Yiran Yu and Licheng Jiao
Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, International Research Center for Intelligent Perception and Computation, Joint International Research, Laboratory of Intelligent Perception and Computation, Xidian University, Xi'an, Shaanxi Province, 710071, China.
- P357** **E-16966** **A New Evolutionary MicroRNA Marker Selection using Next-Generation Sequencing Data 2752**
 Adrian Lancucki¹, Indrajit Saha², Shib Sankar Bhowmick³, Ujjwal Maulik⁴ and Piotr Lipinski¹
¹*Computational Intelligence Research Group, Institute of Computer Science, University of Wrocław, Wrocław, Poland;* ²*National Institute of Technical Teachers' Training & Research, Kolkata — 700106, India;* ³*Department of Electronics & Communication Engineering, Heritage Institute of Technology, Kolkata, India;* ⁴*Department of Computer Science and Engineering, Jadavpur University, Kolkata, West Bengal, India.*
- P358** **E-16295** **Modified Bare Bones Particle Swarm Optimization with Differential Evolution for Large Scale Problem 2760**
 Shiqin Yang and Yuji Sato
Graduate School of Computer and Information Sciences, Hosei University, Tokyo, Japan.
- P359** **E-17180** **Meta-Optimization based Multi-Objective Test Problem Generation using WFG Toolkit 2768**
 Yuki Tanigaki, Yusuke Nojima and Hisao Ishibuchi
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.

- P360** **E-16170** **Optimization of Room Allocation Plans at the University Duisburg-Essen with a Regulatory Algorithm 4815**
 Marcel Kleine-Boyman¹, Christina Klüver² and Jürgen Klüver²
¹University of Duisburg-Essen, Institute for Computer Science and Business Administration, Essen, Germany; ²University of Duisburg-Essen, Computer Based Analysis of Social Complexity, Essen, Germany.

Session WM-12	Differential Evolution / Evolution Strategies
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 202
Chair	Jin Kiat Chong / Hongbin Dong

- 2:30PM** **E-26018** **A Novel Grid-based Differential Evolution (DE) Algorithm for Many-Objective Optimization 2776**
 Jin Kiat Chong and Kay Chen Tan
Department of Electrical & Computer Engineering, National University of Singapore, 119077, Singapore.
- 2:50PM** **E-17128** **A Subpopulation-based Differential Evolution Algorithm for Scheduling with Batching Decisions in Steelmaking-continuous Casting Production 2784**
 Wenjie Xu, Fei Zou and Lixin Tang
Institute of Industrial Engineering & Logistics Optimization, Northeastern University, Shenyang, China.
- 3:10PM** **E-16903** **Differential Evolution-Based PID Control of a Quadrotor System for Hovering Application 2791**
 Jimoh O. Pedro, Muhammed Dangor and Praneet J. Kala
School of Mechanical, Aeronautical and Industrial Engineering, University of the Witwatersrand, WITS2050, South Africa.
- 3:30PM** **E-16084** **Differential Evolution with a Dimensional Mutation Strategy for Global Optimization 2799**
 Jing Guan
China Ship Development and Design Center, Wuhan, 430064, China.
- 3:50PM** **E-16139** **Mixed Mutation Strategy Evolutionary Programming Based on Shapley Value 2805**
 Jinwei Pang¹, Hongbin Dong¹, Jun He² and Qi Feng³
¹Department of Computer Science and Technology, Harbin Engineering University, Harbin, China; ²Department of Computer Science, Aberystwyth University, Wales, UK; ³National Natural Science, Foundation of China, Beijing, China
- 4:10PM** **E-16201** **Global Optimization through Randomized Group Search in Contracting Regions 2813**
 Chao Yu¹, Dipti Srinivasan¹ and Qing-Guo Wang²
¹Department of Electrical and Computer Engineering, National University of Singapore, 117576, Singapore; ²Department of Electrical and Electronic Engineering Science, University of Johannesburg, South Africa

Session WM-13	Engineering Applications
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 203
Chair	Ting Hu / Pranab Muhuri

- 2:30PM** **E-16532** **Evolutionary Design of Fuzzy Logic Controllers for Medium Access Control in WBAN 2821**
Seyed Mohammad Nekooei, Gang Chen and Ramesh Kumar Rayudu
School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.
- 2:50PM** **E-16831** **Evolutionary Algorithmic Deployment of Radio Beacons for Indoor Positioning 2829**
Sipan Ye, Yuanzhu Chen and Ting Hu
Department of Computer Science, Memorial University of Newfoundland, St. John's, NL A1B 3X5, Canada.
- 3:10PM** **E-16933** **Solving Two-Stage Stochastic Mixed-Integer Linear Problems by Ordinal Optimization and Evolutionary Algorithms 2836**
Thomas Siwczyk and Sebastian Engell
Process Dynamics and Operations Group, Department of Biochemical and Chemical Engineering, Technische Universität Dortmund, Dortmund, Germany.
- 3:30PM** **E-17149** **Multi-Objective Bayesian Optimization Algorithm for Real-Time Task Scheduling on Heterogeneous Multiprocessors 2844**
Sajib K. Biswas, Amit Rauniyar and Pranab K. Muhuri
Department of Computer Science, South Asian University, New Delhi-110021, India.
- 3:50PM** **E-16626** **Particle Filter with Lamarckian Inheritance for Nonlinear Filtering 2852**
Lin Li¹, Chaozhu Zhang¹, Zhannan Li¹ and Yun Li²
¹*Department of Information and Communication Engineering, Harbin Engineering University, Harbin, China;* ²*College of Computer Science and Technology, Dongguan University of Technology, Dongguan, 523808, China.*
- 4:10PM** **E-16545** **Cancer Subtype Identification Pipeline: A Classifusion Approach 2858**
Utkarsh Agrawal, Daniele Soria and Christian Wagner
School of Computer Science, University of Nottingham, Nottingham, UK.

Session WM-14	Real-world Applications
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 204
Chair	Wesam Herbawi / Hidefumi Sawai

- 2:30PM** **E-16576** **Virtualized-Elastic-Regenerator Placement by Firefly Algorithm for Translucent Elastic Optical Networks 2866**
Kenji Yamazaki, Haruna Matsushita and Masahiko Jinno
Department of Electronics and Information Engineering, Kagawa University, 2217-20 Hayashi-cho, Takamatsu, Kagawa 761-0396, Japan.
- 2:50PM** **E-16284** **An Evolutionary Algorithm for the Vehicle Relocation Problem in Free Floating Carsharing 2873**
Wesam Herbawi¹, Martin Knoll², Marcus Kaiser² and Wolfgang Gruel³
¹moovel Lab, moovel Group GmbH, Stuttgart, Germany; ²Technical University of Munich, Munich, Germany; ³car2go Group GmbH, Stuttgart, Germany.
- 3:10PM** **E-17090** **Evolving Local Search Heuristics for the Integrated Berth Allocation and Quay Crane Assignment Problem 2880**
Tamer El-boghdadly, Mohamed Bader-El-Den and Dylan Jones
School of Mathematics, University of Portsmouth, Portsmouth PO1 3HF, UK.
- 3:30PM** **E-16220** **Towards High-Performance Global Air Transportation Networks Using Socioeconomic-Environmental Data 2888**
Hidefumi Sawai¹ and Aki-Hiro Sato²
¹Universal Communication Research Institute, National Institute of Information and Communications Technology, 910 North Building, 3-1 Ofuka-cho, Kita-ku, Osaka, 530-0011, Japan; ²Department of Applied Mathematics and Physics, Kyoto University / JST PRESTO, Honmachi, Yoshida, Sakyo-ku, Kyoto, 606-8501, Japan.
- 3:50PM** **E-16610** **A Weight-Aggregation Multi-Objective PSO Algorithm for Load Scheduling of PHEVs 2896**
ShuWei Feng¹, Qi Kang¹, XiaoShuang Chen¹, MengChu Zhou², SiSi Li² and Jing An³
¹Department Control Science & Engineering, Tongji University, Shanghai, China; ²Department Electrical & Computer Engineering, New Jersey Institute of Technology, Newark, NJ, USA; ³School of Electrical & Electronic Engineering, Shanghai Institute of Technology, Shanghai, China.
- 4:10PM** **E-16305** **Using Different Substitution Matrices in a String-Matching Technique for Identifying Viral Polymorphic Malware Variants 2903**
Vijay Naidu and Ajit Narayanan
School of Computer and Mathematical Sciences, Auckland University of Technology, Auckland, New Zealand

Session WM-15	SS CEC-05B: Evolutionary Scheduling and Combinatorial Optimization
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 205
Chair	Su Nguyen / Xiao-Min Hu

- 2:30PM E-16264 A Memetic Algorithm With A Variable Block Insertion Heuristic for Single Machine Total Weighted Tardiness Problem with Sequence Dependent Setup Times 2911**
M. Fatih Tasgetiren¹, Quan-Ke Pan², Yucel Ozturkoglu³ and Angela H. L. Chen⁴
¹Industrial Engineering Department, Yasar University, Izmir, Turkey; ²State Key Laboratory, Huazhong University of Science and Technology, Wuhan, P.R. China; ³International Logistics Department, Yasar University, Izmir, Turkey; ⁴Marketing and Distribution Department, Taoyuan Innovation Institute of Technology, Taiwan.
- 2:50PM E-16723 Minimizing Makespan in Multi-Factory Flow Shop Problem Using a Chemical Reaction Metaheuristic 2919**
Hafewa Bargaoui¹, Olfa Belkahla Driss² and Khaled Ghédira¹
¹Institut Supérieur de Gestion de Tunis, Université de Tunis, 41, Avenue de la Liberté, Cité Bouchoucha, Bardo, Tunis, Tunisie, Stratégies d'Optimisation, et Informatique intelligente (SOIE); ²Ecole Supérieure de Commerce de Tunis, Université de la Manouba, Tunis, Tunisie, Stratégies d'Optimisation et Informatique intelligente (SOIE)
- 3:10PM E-16684 An Effective DE-EDA for Permutation Flow-shop Scheduling Problem 2927**
Zuo-cheng Li, Qingxin Guo and Lixin Tang
Institute of Industrial Engineering & Logistics Optimization, Northeastern University, Shenyang, China.
- 3:30PM E-16143 Memory-based Statistical Learning for The Travelling Salesman Problem 2935**
Yong Xia and Changhe Li
Hubei Key Laboratory of Intelligent Geo-Information Processing, China University of Geosciences, Wuhan, 430074, China.
- 3:50PM E-16486 Differential Evolution with Double-level Archives for Bi-objective Cloud Task Scheduling 2942**
Fei-Long He¹, Wei-Neng Chen² and Xiao-Min Hu¹
¹Sun Yat-sen University, Guangzhou, China, 510006; ²School of Computer Science and Engineering, South China University of Technology, Guangzhou, China
- 4:10PM E-16651 An Improved MOEA/D for Multi-objective Flexible Job Shop Scheduling with Release Time Uncertainties 2950**
Xiaoning Shen, Yi Sun and Min Zhang
B-DAT, CICAET, School of Information and Control, Nanjing University of Information Science and Technology, Nanjing, P.R. China.

Session WM-16	SS CEC-42B: Special Session Associated with Competition on Bound Constrained Single Objective Numerical Optimization
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 206
Chair	Ponnuthurai Nagaratnam Suganthan / Prakash Kotecha

- 2:30PM E-16682 An Ensemble Sinusoidal Parameter Adaptation Incorporated with L-SHADE for Solving CEC2014 Benchmark Problems 2958**
 Noor H. Awad¹, Mostafa Z. Ali^{2,3}, Ponnuthurai N. Suganthan¹ and Robert G. Reynolds⁴
¹*School of Electrical & Electronic Engineering, Nanyang Technological University, 639798, Singapore;* ²*School of Computer Information Systems, Jordan University of Science & Technology, Jordan, 22110;* ³*King Hussein Faculty of Computing Sciences, Princess Sumayya University for Technology, Jordan;* ⁴*College of Engineering, Wayne State University.*
- 2:50PM E-16757 Testing United Multi-operator Evolutionary Algorithms-II on Single Objective Optimization Problems 2966**
 Saber Elsayed, Noha Hamza and Ruhul Sarker
School of Engineering and Information Technology, University of New South Wales at Canberra, Canberra 2600, Australia.
- 3:10PM E-16963 Evaluation of Differential Evolution with Interaction Network on a Real-parameter Optimization Benchmark 2974**
 Pavel Krömer and Petr Gajdoš
Department of Computer, Science, VŠB-Technical University of Ostrava, Ostrava, Czech Republic.
- 3:30PM E-17051 Simultaneous Heat Transfer Search for Computationally Expensive Numerical Optimization 2982**
 Debasis Maharana and Prakash Kotecha
Department of Chemical Engineering, Indian Institute of Technology Guwahati, Guwahati, India.
- 3:50PM E-16425 Single Phase Multi-Group Teaching Learning Algorithm for Computationally Expensive Numerical Optimization (CEC 2016) 2989**
 Remya Kommadath, Chitna Sivadurgaprasad and Prakash Kotecha
Department of Chemical Engineering, Indian Institute of Technology, Guwahati, India.
- 4:10PM E-16423 Reduced Yin-Yang-Pair Optimization and its Performance on the CEC 2016 Expensive Case 2996**
 Varun Punnathanam and Prakash Kotecha
Department of Chemical Engineering, Indian Institute of Technology Guwahati, Guwahati, India.

Session WM-17	SS CEC-34A: Evolutionary Multi-objective Optimization
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 207
Chair	Sanaz Mostaghim / Aimin Zhou

- 2:30PM** **E-16026** **Multi-objective Differential Evolution for Automated Control of Industrial Process Input Material Composition Incorporating Supply-Side Fluctuations 3003**
Arya K. Bhattacharya¹ and Debjani Sambasivam²
¹*Mahindra Ecole Centrale, Hyderabad, 500043, India;* ²*Technologist, Automation Division, Tata Steel, Jamshedpur, 831001, India*
- 2:50PM** **E-17177** **Common Properties of Scalable Multiobjective Problems and a New Framework of Test Problems 3011**
Hiroyuki Masuda, Yusuke Nojima and Hisao Ishibuchi
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.
- 3:10PM** **E-17056** **Analysis and Comparison of Multi-objective Evolutionary Approaches on the Multi-Objective 1/0 Unit Commitment Problem 3019**
Saúl Zapotecas-Martínez¹, Sophie Jacquin², Hernán E. Aguirre¹ and Kiyoshi Tanaka¹
¹*Faculty of Engineering, Shinshu University, 4-17-1 Wakasato, Nagano 380-8553, Japan;* ²*Inria Lille — Nord Europe, DOLPHIN Project-team, CRISTAL, Villeneuve d'Ascq, France.*
- 3:30PM** **E-16590** **Sampling in Latent Space for a Multiobjective Estimation of Distribution Algorithm 3027**
Bing Dong, Aimin Zhou and Guixu Zhang
Shanghai Key Laboratory of Multidimensional Information Processing, Department of Computer Science and Technology, East China Normal University, 500 Dongchuan Road, Shanghai, China.
- 3:50PM** **E-17110** **A Ranking and Selection Strategy for Preference-based Evolutionary Multi-objective Optimization of Variable-Noise Problems 3035**
Florian Siegmund¹, Amos H. C. Ng¹ and Kalyanmoy Deb²
¹*School of Engineering Science, University of Skövde, Högskölevägen, 54128 Skövde, Sweden;* ²*Department of Electrical and Computer Engineering, Michigan State University, 428 S. Shaw Lane, East Lansing, MI 48824, USA.*
- 4:10PM** **E-17176** **Performance Comparison of NSGA-II and NSGA-III on Various Many-Objective Test Problems 3045**
Hisao Ishibuchi, Ryo Imada, Yu Setoguchi and Yusuke Nojima
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.

Session WM-18	Workshop-03A: Key Challenges and Future Directions of Evolutionary Computation
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 208+209
Chair	Yun Li / Piero Bonissone

- 2:30PM E-26001 Landscape Synergy in Evolutionary Multitasking 3076**
A. Gupta¹, Y. S. Ong^{1,2}, B. Da², L. Feng³ and S. D. Handoko⁴
¹*Rolls-Royce@NTU Corporate Lab c/o, School of Computer Engineering, Nanyang Technological University, Singapore;* ²*Computational Intelligence Lab, Nanyang Technological University, Singapore;* ³*College of Computer Science, Chongqing University, China;* ⁴*School of Information Systems, Singapore Management University, Singapore.*
- 2:50PM E-16575 Evolutionary Scheduling and Combinatorial Optimisation: Applications, Challenges, and Future Directions 3053**
Su Nguyen^{1,2}, Yi Mei¹, Hui Ma¹, Aaron Chen¹ and Mengjie Zhang¹
¹*Evolutionary Computation Research Group, Victoria University of Wellington, New Zealand;* ²*Hoa Sen University, Ho Chi Minh City, Vietnam*
- 3:10PM E-16942 Evolutionary Computation for Feature Manipulation: Key Challenges and Future Directions 3061**
Bing Xue and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.
- 3:30PM E-17175 Genetic Improvement: A Key Challenge for Evolutionary Computation 3068**
William B. Langdon and Gabriela Ochoa
Computer Science, University College London, London, WC1E 6BT, UK. and Computer Science, University of Stirling, Stirling, FK9 4LA, UK

Session WP-12	Evolved Neural Networks / Evolutionary Fuzzy Systems
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 202
Chair	Katya Rodriguez / Oscar Castillo

- 4:30PM E-16782 Multi-Step-Ahead Chaotic Time Series Prediction using Coevolutionary Recurrent Neural Networks 3084**
Shamina Hussein¹, Rohitash Chandra² and Anuraganand Sharma¹
¹*School of Computing Information and Mathematical Sciences, University of South Pacific, Suva, Fiji;* ²*Artificial Intelligence and Cybernetics Research Group, Software Foundation, Nausori, Fiji.*
- 4:50PM E-16127 Complexity-based Speciation and Genotype Representation for Neuroevolution 3092**
Alexander Hadjiivanov and Alan Blair
School of Computer Science and Engineering, University of New South Wales, Sydney, NSW 2052, Australia.

- 5:10PM** **E-16505** **Neuron-Synapse Level problem decomposition method for Cooperative Coevolution of Recurrent Networks for Time Series Prediction 3102**
Ravneil Nand
School of Computing Information and Mathematical Sciences University of South Pacific, Suva, Fiji. and Artificial Intelligence and Cybernetics Research Group, Software Foundation, Nausori, Fiji.
- 5:30PM** **E-17164** **Generalized Neurons and its Application in DNA Microarray Classification 3110**
Beatriz A. Garro¹, Katya Rodríguez¹ and Roberto A. Vazquez²
¹Instituto en Investigaciones en, Matemáticas Aplicadas y en Sistemas, Universidad Nacional Autónoma de México, Ciudad Universitaria, México, D.F.; ²Intelligent Systems Group, Facultad de Ingeniería, Universidad La Salle, Benjamin Franklin 47, Col. Condesa, CP 06140, D.F., México.
- 5:50PM** **E-16266** **Grey Wolf Optimizer with Dynamic Adaptation of Parameters Using Fuzzy Logic 3116**
Luis Rodríguez, Oscar Castillo and José Soria
Tijuana Institute of Technology, Tijuana, Mexico.
- 6:10PM** **E-16785** **Gene Expression Data Classification using Automatic Differential Evolution Based Algorithm 3124**
Ranjita Das¹ and Sriparna Saha²
¹Department of Computer Science and Engineering, National Institute of Technology, Mizoram, 796012, India; ²Indian Institute of Technology, Patna, 800013, India.

Session WP-13	SS CEC-46: Bio-inspired and Evolutionary Computation Methods for Unsupervised Learning / SS CEC-32: Differential Evolution: Past, Present and Future
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 203
Chair	David Camacho / Kai Qin

- 4:30PM** **E-16974** **Evolutionary Semi-supervised Rough Categorization of Brain Signals from a Wearable Headband 3131**
Glavin Wiechert, Matt Triff, Zhixing Liu, Zhicheng Yin, Shuai Zhao, Ziyun Zhong and Pawan Lingras
Mathematics and Computing Science, Saint Mary's University, Halifax, Canada.
- 4:50PM** **E-16405** **A Novel Adaptive Density-based ACO Algorithm with Minimal Encoding Redundancy for Clustering Problems 3139**
Esther Villar-Rodriguez¹, Antonio Gonzalez-Pardo², Javier Del Ser^{1,3}, Miren Nekane Bilbao³ and Sancho Salcedo-Sanz⁴
¹TECNALIA. OPTIMA Unit, E-48160, Derio, Spain; ²Basque Center for Applied Mathematics (BCAM), 48009, Bilbao, Spain; ³University of the Basque Country UPV EHU, 48013, Bilbao, Spain; ⁴University of Alcalá, 28871 Alcalá de Henares, Madrid, Spain.

- 5:10PM E-16870 A Method for Building Predictive HSMMs in Interactive Environments 3146**
 Víctor Rodríguez-Fernández, Antonio Gonzalez-Pardo and David Camacho
Universidad Autónoma, de Madrid (UAM), 28049, Madrid, Spain.
- 5:30PM E-16652 Differential Evolution with Stochastic Fractal Search Algorithm for Global Numerical Optimization 3154**
 Noor H. Awad¹, Mostafa Z. Ali², Ponnuthurai N. Suganthan¹ and Edward Jaser²
¹*School of Electrical & Electronic Engineering, Nanyang Technological University, 639798, Singapore;* ²*Princess Sumayya University for Technology, King Hussein Faculty of Computing Sciences, Jordan.*
- 5:50PM E-16354 Adaptive CR Values with Fuzzy Inference System for Differential Evolution Algorithm 3162**
 Jing-Zhong Wang and Tsung-Ying Sun
Department of Electrical Engineering, National Dong Hwa University, Hualien, Taiwan, R.O.C.
- 6:10PM E-16478 Differential Evolution with a Two-Stage Optimization Mechanism for Numerical Optimization 3170**
 Zhi-Zhong Liu¹, Yong Wang^{1,2}, Shengxiang Yang² and Zixing Cai¹
¹*School of Information Science and Engineering, Central South University, Changsha 410083, China;* ²*School of Computer Science and Informatics, De Montfort University, Leicester LE1 9BH, UK.*

Session WP-14	Memetic Computing, Multi-meme and Hybrid Algorithms
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 204
Chair	Bo Liu / Jiarui Zhou

- 4:30PM E-16064 An Effective TLBO-Based Memetic Algorithm for Hypersonic Reentry Trajectory Optimization 3178**
 Xinghua Qu¹, Huifeng Li¹, Ran Zhang¹ and Bo Liu²
¹*Astronautics School, Beihang University, Beijing, China;* ²*Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China.*
- 4:50PM E-16166 A Simultaneous Perturbation Stochastic Approximation Enhanced Teaching-Learning based Optimization 3186**
 Ao Liu¹, Xudong Deng¹, Zeping Tong¹, Youngliang Luo² and Bo Liu³
¹*School of Management, Wuhan University of Science and Technology, Wuhan, 430081, China;* ²*System Engineering Research Institute, Beijing, 100094, China;* ³*Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, 100094, China.*

- 5:10PM** **E-16182** **Metabolomics Biomarker Discovery Using Multimodal Memetic Algorithm and Multivariate Mutual Information Based Feature Selection** **3193**
 Jiarui Zhou^{1,2}, Zhen Ji³, Zexuan Zhu³ and Shan He²
¹School of Computer Science and Technology, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, 518055, China; ²School of Computer Science, University of Birmingham, Birmingham, B15 2TT, UK; ³Shenzhen City Key Laboratory of Embedded System Design, College of Computer Science and Software Engineering, Shenzhen University, Shenzhen, 518060, China
- 5:30PM** **E-16296** **A Memetic Algorithm Using Partial Solutions for Graph Coloring Problem** **3200**
 Ziwei Zhuang, Hedong Xu, Suohai Fan and Jing Zheng
College of Information Science and Technology, Jinan University, Guangzhou 510632, China.
- 5:50PM** **E-16663** **Energy Consumption Prediction for Steelmaking Production Using PSO-based BP Neural Network** **3207**
 Yanyan Zhang^{1,2}, Shengnan Zhao^{1,2} and Lixin Tang¹
¹State Key Laboratory of Synthetical Automation for Process Industries, Northeastern University, Shenyang 110819, People's Republic of China; ²Institute of Industrial Engineering & Logistics Optimization, Northeastern University, Shenyang 110819, People's Republic of China
- 6:10PM** **E-16499** **A Multi-agent Genetic Algorithm for Local Community Detection by Extending the Tightest Nodes** **3215**
 Peng Wang and Jing Liu
Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, Xi'an 710071, China.

Session WP-15	Discrete and Combinatorial Optimization
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 205
Chair	Roberto Santana / Saman Halgamuge

- 4:30PM** **E-16975** **Maximal Nonlinearity in Balanced Boolean Functions with Even Number of Inputs, Revisited** **3222**
 Stjepan Picek¹, Roberto Santana² and Domagoj Jakobovic³
¹KU Leuven, ESAT/COSIC and iMinds, Kasteelpark Arenberg 10, bus 2452, B-3001 Leuven-Heverlee, Belgium; ²Comp. Sci. & Artif. Intell., University of the Basque Country, San Sebastian, Spain; ³Faculty of Electrical Engineering and Computing, University of Zagreb, Zagreb, Croatia
- 4:50PM** **E-16288** **Intelligent Scheduling in Flexible Job Shop Environments Based on Artificial Fish Swarm Algorithm with Estimation of Distribution** **3230**
 Ge Hongwei and Sun Liang
College of Computer Science and Technology, Dalian University of Technology, Dalian, China.

- 5:10PM E-16593 Restricting the Search Space to Boost Quantum Annealing Performance 3238**
 Pierre Bergé¹, Baptiste Cavarec¹, Arpad Rimmel² and Joanna Tomasik²
¹CentraleSupélec, Université Paris-Saclay, 3 rue Joliot-Curie, 91192 Gif-sur-Yvette, France; ²LRI, CentraleSupélec, Université Paris-Saclay, Bat 650, Rue Noetzlin, 91405 Orsay, France
- 5:30PM E-16625 Iterated Local Search Algorithm for Clustering Wireless Sensor Networks 3246**
 Muiyiwa Olakanmi Oladimeji, Mikdam Turkey and Sandra Dudley
 School of Engineering, London South Bank University, 103 Borough Road, SE1 0AA, London.
- 5:50PM E-16191 Fast Algorithms Inspired by Physarum Polycephalum for Node Weighted Steiner Tree Problem with Multiple Terminals 3254**
 Yahui Suna and Saman Halgamuge
 Department of Mechanical Engineering, University of Melbourne, Melbourne, Victoria 3010, Australia.
- 6:10PM E-16672 A Discrete Bacterial Memetic Evolutionary Algorithm for the Traveling Salesman Problem 3261**
 László T. Kóczy¹, Péter Földesi² and Boldizsár Tüü-Szabó³
¹Department of Information Technology, Széchenyi István University Győr, Hungary and Department of Telecommunications and Media Informatics, Budapest University of Technology and Economics, Budapest, Hungary;
²Department of Logistics, Széchenyi István University, Győr, Hungary;
³Department of Information Technology, Széchenyi István University, Győr, Hungary.

Session WP-16	SS CEC-20: When Evolutionary Computation Meets Data Mining
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 206
Chair	Zhun Fan / Xinye Cai

- 4:30PM E-16812 An Estimation of Distribution Algorithm Guided by Mean Shift 3268**
 Hui Fang, Aimin Zhou and Guixu Zhang
 Shanghai Key Laboratory of Multidimensional Information Processing, Department of Computer Science and Technology, East China Normal University, 500 Dongchuan Road, Shanghai, China.
- 4:50PM E-16090 Classification Guided Differential Evolution 3276**
 Shiyan Shen, Wenyin Gong and Zhihua Cai
 School of Computer Science, China University of Geosciences, Wuhan, 430074, China.
- 5:10PM E-16913 A Multi-phase Adaptively Guided Multiobjective Evolutionary Algorithm Based on Decomposition for Travelling Salesman Problem 3284**
 Ning Zhang¹, Xinye Cai¹ and Zhun Fan²
¹School of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics, Jiangsu, China; ²School of Engineering, Shantou University, Guangdong, China.

- 5:30PM** **E-16596** **A Decomposition based Multiobjective Evolutionary Algorithm with Classification** 3292
Xi Lin, Qingfu Zhang and Sam Kwong
Department of Computer Science, City University of Hong Kong, Tat Chee Avenue, Hong Kong SAR.
- 5:50PM** **E-17080** **An Initialization Method for Grammatical Evolution Assisted by Decision Trees** 3300
Igor L. S. Russo¹, Heder S. Bernardino¹, Carlos C. H. Borges¹ and Helio J.C. Barbosa^{1,2}
¹*UFJF, Juiz de Fora-MG, Brazil;* ²*LNCC, Petrópolis-RJ, Brazil*
- 6:10PM** **E-16009** **Evolutionary Multi-objective Optimization for Multi-view Clustering** 3308
Bo Jiang¹, Feiyue Qiu¹, Shipin Yang² and Liping Wang³
¹*College of Education Science and Technology, Zhejiang University of Technology, Hangzhou, 310023, China;* ²*College of Electrical Engineering and Control Science, Nanjing Tech University, Nanjing, 211800, China;* ³*College of Administration and Management, Zhejiang University of Technology, Hangzhou, 310023, China.*

Session WP-17	SS CEC-34B: Evolutionary Multi-objective Optimization / SS CEC-52: Hidden Complex Networks in Evolutionary Dynamics. Past, Present and Future
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 207
Chair	Ivan Zelinka / Magdalena Metlicka

- 4:30PM** **E-26027** **Multi-objective Fitness-proportional Attraction Approach with Weights** 3316
Patrick Laack, Heiner Zille and Sanaz Mostaghim
Institute for Intelligent, Cooperative Systems, Otto-von-Guericke University, Magdeburg, Germany.
- 4:50PM** **E-16634** **Complex Network based Adaptive Artificial Bee Colony algorithm** 3324
Magdalena Metlicka¹ and Donald Davendra^{1,2}
¹*Department of Computer Science, Faculty of Electrical Engineering and Computer Science, VŠB-Technical University of Ostrava, 17. listopadu 15, 708 33 Ostrava-Poruba, Czech Republic;* ²*Department of Computer Science, Central Washington University, 400 East University Way, Ellensburg, WA 98926, United States.*
- 5:10PM** **E-16382** **Complex Network Analysis in PSO as an Fitness Landscape Classifier** 3332
Michal Pluhacek¹, Roman Senkerik¹, Adam Viktorin¹, Jakub Janostik¹ and Donald Davendra²
¹*Faculty of Applied Informatics, Tomas Bata University in Zlin, T.G. Masaryka 5555, 760 01 Zlin, Czech Republic;* ²*Computer Science Department, Central Washington University, 400 E. University Way, Ellensburg, WA 98926-7520 USA.*

- 5:30PM** **E-16633** **Complex Network Analysis based Adaptive Differential Evolution 3338**
 Magdalena Metlicka¹ and Donald Davendra^{1,2}
¹*Department of Computer Science, Faculty of Electrical Engineering and Computer Science, VŠB-Technical University of Ostrava, 17. listopadu 15, 708 33 Ostrava-Poruba, Czech Republic;* ²*Department of Computer Science, Central Washington University, 400 East University Way, Ellensburg, WA 98926, United States.*
- 5:50PM** **E-17068** **On the Influence of Different Randomization and Complex Network Analysis for Differential Evolution 3346**
 Roman Senkerik¹, Adam Viktorin¹, Michal Pluhacek¹, Jakub Janostik¹ and Donald Davendra²
¹*Faculty of Applied Informatics, Tomas Bata University in Zlin, T.G. Masaryka 5555, 760 01 Zlin, Czech Republic;* ²*Computer Science Department, Central Washington University, 400 E. University Way, Ellensburg, WA 98926-7520, USA.*
- 6:10PM** **E-16258** **Small-World Hidden in Differential Evolution 3354**
 Lenka Skanderova, Tomas Fabian and Ivan Zelinka
VSB — Technical University of Ostrava, Department of Computer Science, Ostrava, Czech Republic.

Session WP-18	Workshop-03B: Key Challenges and Future Directions of Evolutionary Computation
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 208+209
Chair	Yun Li / Piero Bonissone

Session HA-12	SS CEC-05C: Evolutionary Scheduling and Combinatorial Optimization
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 202
Chair	Su Nguyen / Yuping Wang

- 8:00AM E-16994 Improving Job Shop Dispatching Rules via Terminal Weighting and Adaptive Mutation in Genetic Programming 3362**
Michael Riley, Yi Mei and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, PO Box 600, Wellington, New Zealand.
- 8:20AM E-26012 Maximising Total Weighted Number of Activities for Reservation with Slack 3370**
Su Nguyen^{1,2}, Mengjie Zhang² and Kay Chen Tan³
¹*Hoa Sen University, Ho Chi Minh City, Vietnam;* ²*Evolutionary Computation Research Group, Victoria University of Wellington, New Zealand;* ³*Department of Electrical and Computer Engineering, National University of Singapore, Singapore.*
- 8:40AM E-16238 Multi-objective Scheduling for Divisible Load in Heterogeneous Distributed System 3378**
Hejun Xuan, Yuping Wang, Shanshan Hao and Xiaoli Wang
School of Computer Science and Technology, Xidian University, Xi'an, Shaanxi, 710071, China.
- 9:00AM E-16439 A Memetic Algorithm-Based Indirect Approach to Web Service Composition 3385**
Alexandre Sawczuk da Silva, Yi Mei, Hui Ma and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, New Zealand.
- 9:20AM E-16056 A Pareto based Fruit Fly Optimization Algorithm for Task Scheduling and Resource Allocation in Cloud Computing Environment 3393**
Xiao-long Zheng and Ling Wang
Department of Automation, Tsinghua University, Beijing, 100084, China.
- 9:40AM E-16911 A Discrete Artificial Bee Colony Algorithm for the Permutation Flowshop Scheduling Problem with Sequence-Dependent Setup Times 3401**
Yavuz Ince¹, Korhan Karabulut², M. Fatih Tasgetiren³ and Quan-ke Pan⁴
¹*Computer Engineering Department, Gediz University, Izmir, Turkey;* ²*Software Engineering Department, Yasar University, Izmir, Turkey;* ³*Industrial Engineering Department, Yasar University, Izmir, Turkey;* ⁴*State Key Lab, Northeastern University, henyang, China.*

Session HA-13	Estimation of Distribution Algorithms
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 203
Chair	John McCall / Amin Nikanjam

- 8:00AM** **E-16557** **How Effective is Cauchy-EDA in High Dimensions? 3409**
 Momodou L. Sanyang¹, Robert J. Durrant² and Ata Kabán¹
¹School of Computer Science, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK; ²Department of Statistics, University of Waikato, Private Bag 3105, Hamilton 3240, NZ.
- 8:20AM** **E-16709** **BPGA-EDA for the Multi-Mode Resource Constrained Project Scheduling Problem 3417**
 Mayowa Ayodele, John McCall and Olivier Regnier-Coudert
Robert Gordon University, Aberdeen, Scotland.
- 8:40AM** **E-16265** **Estimation Multivariate Normal Algorithm with Threshold Convergence 3425**
 Dania Tamayo-Vera¹, Antonio Bolufe-Röhler¹ and Stephen Chen²
¹School of Mathematics and Computer Science, University of Havana, Havana, Cuba; ²School of Information Technology, York University, Toronto, Canada.
- 9:00AM** **E-16904** **PASCAL: An EDA for Parameterless Shape-Independent Clustering 3433**
 Henry E. L. Cagnini and Rodrigo C. Barros
Pontificia Universidade Católica do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil.
- 9:20AM** **E-16958** **Enhance Continuous Estimation of Distribution Algorithm by Variance Enlargement and Reflecting Sampling 3441**
 Zhigang Ren, Chenlong He, Dexing Zhong, Shanshan Huang and Yongsheng Liang
Department of Automation Science and Technology, School of Electronic and Information Engineering, Xi'an Jiaotong University, Xi'an, China.
- 9:40AM** **E-17091** **Multi-Structure Problems: Difficult Model Learning in Discrete EDAs 3448**
 Amin Nikanjam¹ and Hossein Karshenas²
¹Faculty of Computer Engineering, K.N.Toosi University of Technology, Tehran, Iran; ²Department of Artificial Intelligence, Faculty of Computer Engineering, University of Isfahan, Iran.

Session HA-14	SS CDCI-09: Computational Intelligence for Economics and Finance
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 204
Chair	Okan Duru / Piotr Lipinski

8:00AM	E-16134	<p>Equity Price Direction Prediction for Day Trading — Ensemble Classification Using Technical Analysis Indicators with Interaction Effects 3455</p> <p>Dirk Van den Poel¹, Céline Chesterman¹, Maxim Koppen¹ and Michel Ballings²</p> <p>¹Faculty of Economics and Business Administration, Ghent University, Tweekerkenstraat 2, Ghent, B-9000, Belgium; ²Department of Business Analytics and Statistics, University of Tennessee, Knoxville, TN 37996, USA</p>
8:20AM	E-17183	<p>Stationarity Control in the Fuzzy Time Series and Neural Network Algorithms 3463</p> <p>Okan Duru¹ and Matthew Butler²</p> <p>¹Department of Maritime Administration, Texas A&M University at Galveston, Galveston TX, USA; ²Department of Computer Science, University of York, York, UK.</p>
8:40AM	E-16585	<p>Combining Cloud Computing, Machine Learning and Heuristic Optimization for Investment Opportunities Forecasting 3469</p> <p>Zhixi Li, Vincent Tam and Lawrence Yeung</p> <p>Department of Electrical and Electronic Engineering, The University of Hong Kong, Pokfulam Road, Hong Kong, China.</p>
9:00AM	E-16325	<p>Polarity Propagation of Financial Terms for Market Trend Analyses Using News Articles 3477</p> <p>Tomoki Ito¹, Kiyoshi Izumi¹, Kota Tsubouchi² and Tatsuo Yamashita²</p> <p>¹School of Engineering, The University of Tokyo, Japan; ²Yahoo! JAPAN Research, Japan</p>
9:20AM	E-16744	<p>Feature Engineering for Improving Financial Derivatives-based Rainfall Prediction 3483</p> <p>Sam Cramer, Michael Kampouridis and Alex A. Freitas</p> <p>School of Computing, University of Kent, UK.</p>
9:40AM	E-17033	<p>Multiobjective Optimization of Frequent Pattern Models in Ultra-High Frequency Time Series: Stability versus Universality 3491</p> <p>Krzysztof Michalak¹, Adrian Lancucki² and Piotr Lipinski²</p> <p>¹Department of Information Technologies, Institute of Business Informatics, Wroclaw University of Economics, Wroclaw, Poland; ²Computational Intelligence Research Group, Institute of Computer Science, University of Wroclaw, Wroclaw, Poland.</p>

Session HA-15	Evolutionary Games and Multi-agent Systems / SS CEC-51: Evolutionary Computation for Human Center Decision Making Systems: Trends and Applications
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 205
Chair	Saber Elsayed / Ana Maria Madureira

- 8:00AM** **E-16935** **Iterated Prisoner’s Dilemma with Extortionate Zero-Determinant Strategies and Random-Memory Opponents 3499**
Franklin Kenter and Emily Meigs
Computational and Applied Mathematics Rice University, USA.
- 8:20AM** **E-16979** **A Co-evolutionary Approach for Optimal Bidding Strategy of Multiple Electricity Suppliers 3507**
M. F. Zaman, Saber M. Elsayed, Tapabrata Ray and Ruhul A. Sarker
School of Engineering and Information Technology, University of New South Wales at Australian Defence Force Academy, Canberra 2600, Australia.
- 8:40AM** **E-16061** **A Pareto Non-Dominated Solution Approach for the Vehicle Routing Problem with Multiple Time Windows 3515**
Slim Belhaiza¹ and Rym M’Hallah²
¹Department of Mathematics and Statistics, King Fahd University of Petroleum & Minerals, KSA; ²Department of Statistics and Operations Research, Kuwait University, Kuwait.
- 9:00AM** **E-16743** **What Cost Teamwork: Quantifying Situational Awareness and Computational Requirements in a Proto-Team via Multi-Objective Evolution 3525**
Michael Barlow and Erandi Lakshika
School of Engineering & IT, University of New South Wales, Canberra, Australia.
- 9:20AM** **E-16868** **Leveraging Evolutionary Algorithms for Dynamic Multi-Objective Optimization Scheduling of Multi-tenant Smart Home Appliances 3533**
Walid Trabelsi¹, Radhia Azzouz², Slim Bechikh² and Lamjed Ben Said²
¹International Business Machines Corporation, Cork, Ireland; ²SOIE laboratory, University of Tunis, Tunisia.

Session HA-16	SS CEC-44: Large Scale Global Optimization
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 206
Chair	Daniel Molina / Shahryar Rahnamayan

- 8:00AM E-16424 CBCC3 — A Contribution-Based Cooperative Co-evolutionary Algorithm with Improved Exploration/Exploitation Balance 3541**
 Mohammad Nabi Omidvar¹, Borhan Kazimipour², Xiaodong Li² and Xin Yao¹
¹*School of Computer Science, University of Birmingham, Birmingham B15 2TT, UK;* ²*School of Computer Science and Information Technology, RMIT University, Melbourne, VIC 3000, Australia.*
- 8:20AM E-16488 Multiple Parents Guided Differential Evolution for Large Scale Optimization 3549**
 Qiang Yang^{1,2}, Han-Yu Xie², Wei-Neng Chen¹ and Jun Zhang¹
¹*School of Computer Science and Engineering, South China University of Technology, Guangzhou, China, 510006.;* ²*School of Data and Computer Science, Sun Yat-sen University, Guangzhou, China, 510006.*
- 8:40AM E-16075 Center-Based Initialization of Cooperative Co-evolutionary Algorithm for Large-scale Optimization 3557**
 Sedigheh Mahdavi¹, Shahryar Rahnamayan¹ and Kalyanmoy Deb²
¹*Department of Electrical, Computer and Software Engineering, University of Ontario Institute of Technology (UOIT), Oshawa, Canada;* ²*Department of Electrical and Computer Engineering, Michigan State University, East Lansing, USA.*
- 9:00AM E-16334 100 Million Dimensions Large-Scale Global Optimization Using Distributed GPU Computing 3566**
 Alberto Cano¹ and Carlos García-Martínez²
¹*Computer Science Department, Virginia Commonwealth University, Richmond, Virginia, 23284, USA;* ²*Computing and Num. Analysis Department, University of Córdoba, Córdoba, 14071, Spain.*
- 9:20AM E-16768 A Coral Reefs Optimization Algorithm with Substrate Layers and Local Search for Large Scale Global Optimization 3574**
 S. Salcedo-Sanz¹, C. Camacho-Gómez¹, D. Molina² and F. Herrera³
¹*Department of Signal Processing and Communications, Universidad de Alcalá, Madrid, Spain;* ²*Department of Computer Science, Universidad de Cádiz, Spain;* ³*Department of Computer Science and Artificial Intelligence, Universidad de Granada, Spain.*

Session HA-17	SS CEC-39: Transfer Learning in Evolutionary Computation / SS CEC-40: Advances in Decomposition based Evolutionary Multi objective Optimization (ADEMO)
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 207
Chair	Bing Xue / Saul Zapotecas-Martinez

- 8:00AM** **E-16473** **Improving Classification on Images by Extracting and Transferring Knowledge in Genetic Programming 3582**
 Muhammad Iqbal, Mengjie Zhang and Bing Xue
School of Engineering and Computer Science, Victoria University of Wellington, Wellington 6140, New Zealand.
- 8:20AM** **E-16462** **A Comprehensive Analysis on Reusability of GP-Evolved Job Shop Dispatching Rules 3590**
 Yi Mei and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, PO Box 600, Wellington 6140, New Zealand.
- 8:40AM** **E-16869** **Further Investigation on Genetic Programming with Transfer Learning for Symbolic Regression 3598**
 Edward Haslam, Bing Xue and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.
- 9:00AM** **E-16355** **Dividing Rectangles Attack Multi-Objective Optimization 3606**
 Abdullah Al-Dujaili and S. Suresh
School of Computer Engineering, Nanyang Technological University, Singapore, 639798, Singapore.
- 9:20AM** **E-16501** **A Memetic Algorithm Based on MOEA/D for Near Space Communication System Deployment Optimization on Tide User Model 3614**
 Zhao Wang¹, Maoguo Gong¹, Yu Lei², Shanfeng Wang¹ and Linzhi Su¹
¹Key Laboratory of Intelligent Perception and Image Understanding, Xidian University, Xi'an, China; ²School of Electronics and Information, Northwestern Polytechnical University, Xi'an, China.

Session HA-18	SS CDCI-13A: Computational Intelligence in Power System
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 208+209
Chair	Kumarappan Narayanan / Anupam Trivedi

- 8:00AM E-16401 Ensemble Classifier Selection Using Multi-Objective PSO for Fault Diagnosis of Power Transformers 3622**
Abdolrahman Peimankar¹, Stephen John Weddell¹, Thahirah Jalal² and Andrew Craig Laphorn¹
¹*School of Electrical and Computer Engineering, University of Canterbury, Christchurch, New Zealand;* ²*Unison Networks Limited, Hastings, New Zealand*
- 8:20AM E-16555 Optimal Placement of Distributed Generation in Micro-grids with Binary and Integer-encoding Evolutionary Algorithms 3630**
C. Camacho-Gómez, R. Mallol-Poyato, S. Jiménez-Fernández, L. Cornejo-Bueno and S. Salcedo-Sanz
Department of Signal Processing and Communications, Universidad de Alcalá, Madrid, Spain.
- 8:40AM E-16594 Feature Selection in Solar Radiation Prediction using Bootstrapped SVRs 3638**
O. García-Hinde¹, V. Gómez-Verdejo¹, M. Martínez-Ramón^{1,2}, C. Casanova-Mateo^{3,4}, J. Sanz-Justo⁴, S. Jiménez-Fernández⁵ and S. Salcedo-Sanz⁵
¹*Department of Signal Processing and Communications, Universidad Carlos III de Madrid, Spain;* ²*Department of Electrical and Computing Engineering, The University of New Mexico, NM, USA;* ³*Department of Civil Engineering: Construction, Infrastructure and Transport, UPM, Madrid;* ⁴*LATUV, Universidad de Valladolid, Valladolid, Spain;* ⁵*Department of Signal Processing and Communications, Universidad de Alcalá, Madrid, Spain*
- 9:00AM E-16664 Optimal Charging Scheduling of Plug-in Electric Vehicles for Maximizing Penetration within a Workplace Car Park 3646**
R. Mehta, D. Srinivasan and A. Trivedi
department of Electrical and Computer Engineering, National University of Singapore, 117580, Singapore.
- 9:20AM E-16761 A Novel Hybrid Method for Planning and Allocation of DGs in Medium Voltage Networks considering Voltage Regulation and Relay Coordination 3654**
Dhivya Sampath Kumara¹, Dipti Srinivasan¹ and Thomas Reindl²
¹*Department of Electrical and Computer Engineering, National University of Singapore, Singapore;* ²*Solar Energy Research Institute Singapore, National University of Singapore, Singapore*
- 9:40AM E-16998 A Search Group Algorithm for Optimal Voltage Regulation in Power Systems 3662**
Giovanni Acampora¹, Davide Caruso², Alfredo Vaccaro² and Autilia Vitiello³
¹*School of Science and Technology, Nottingham Trent University, Nottingham NG11 8NS, United Kingdom;* ²*Department of Engineering, University of Sannio, Benevento, 82100 Italy;* ³*Department of Computer Science, University of Salerno, Fisciano, 84084 Italy.*

Session	[Plenary] – Is Evolutionary Computing Evolving Fast Enough?, Prof. Graham Kendall
Date/Time	Thursday, 28 July 2016 / 1:00PM – 2:00PM
Venue	Room Ballroom C
Chair	Yuhui Shi

Session HM-12	Multiobjective Optimization
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 202
Chair	Beatrice Lazzerini / Timothy Havens

- 2:30PM** **E-16636** **Multi-objective Optimization Approach to Stock Market Technical Indicators 3670**
Ricardo de Almeida, Gilberto Reynoso-Meza and Maria Teresinha Arns Steiner
Programa de Pós-Graduação em Engenharia de Produção e Sistemas PUC-PR, Curitiba, Brazil.
- 2:50PM** **E-16359** **Pareto-Based Many-Objective Optimization using Knee Points 3678**
Justin Maltese¹, Beatrice M. Ombuki-Berman¹ and Andries. P. Engelbrecht²
¹*Department of Computer Science, Brock University, St. Catharines, ON, Canada;* ²*Department of Computer Science, University of Pretoria, Pretoria, South Africa.*
- 3:10PM** **E-17055** **Coverage Optimization in a Terrain-Aware Wireless Sensor Network 3687**
Husam I. Sweidan¹ and Timothy C. Havens²
¹*Department of Electrical and Computer Engineering, Michigan Technological University, Houghton, Michigan, 49931-1295;* ²*Department of Electrical and Computer Engineering, Department of Computer Science, Michigan Technological University, Houghton, Michigan, 49931-1295, USA.*
- 3:30PM** **E-16982** **A Semi-Supervised Learning-Aided Evolutionary Approach to Occupational Safety Improvement 3695**
Marco Cococcioni, Beatrice Lazzerini and Francesco Pistolesi
Department of Information Engineering, University of Pisa, Address: Largo L. Lazzarino 1, 56122 Pisa, IT.
- 3:50PM** **E-16751** **Evolutionary Algorithm with Parallel Evaluation Strategy Using Constrained Penalty-based Boundary Intersection 3702**
Taiga Kato and Koji Shimoyama
Institute of Fluid Science, Tohoku University, Sendai 980-8577, Japan.
- 4:10PM** **E-16821** **A Decomposition-based Approach for Knee Solution Approximation in Multi-objective Optimization 3710**
Sufian Sudeng and Naruemon Wattanapongsakorn
Department of Computer Engineering, King Mongkut's University of Technology Thonburi, Bangkok, 10140, Thailand.

Session HM-13	Estimation of Distribution Algorithms / SS CEC-12: Brain Storm Optimization Algorithms
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 203
Chair	Marley Velasco / Shi Cheng

- 2:30PM E-16598 Large Scale Continuous EDA Using Mutual Information 3718**
 Qi Xu, Momodou L. Sanyang and Ata Kabán
School of Computer Science, University of Birmingham.
- 2:50PM E-17115 SMS-EDA-MEC: Extending Copula-based EDAs to Multi-Objective Optimization 3726**
 Luis Martí^{1,2}, Harold D. de Mello Jr.³, Nayat Sanchez-Pi³ and Marley Velasco⁴
¹Universidade Federal Fluminense, Niterói (RJ) Brazil; ²TAO team, CNRS/INRIA/LRI, Université Paris-Saclay, Paris, France; ³Universidade do Estado do Rio de Janeiro, Rio de Janeiro (RJ), Brazil; ⁴Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro (RJ), Brazil
- 3:10PM E-16799 On the Quality of Graphs Generated by Swarm Algorithms 3734**
 Matthias Becker
University Hannover, FG Simulation, Welfengarten 1, 30167 Hannover, Germany
- 3:30PM E-16415 A Study of Constraint-Handling Techniques in Brain Storm Optimization 3740**
 Adriana Cervantes-Castillo and Efrén Mezura-Montes
Artificial Intelligence Research Center, University of Veracruz, Sebastián Camacho 5, Centro, Xalapa, Veracruz, 91000, México.
- 3:50PM E-16095 Convergence Analysis of Brain Storm Optimization Algorithm 3747**
 Ziwei Zhou¹, Haibin Duan¹ and Yuhui Shi²
¹School of Automation Science and Electrical Engineering, Beihang University, Beijing, 100191, China; ²Xi'an Jiaotong-Liverpool University, Suzhou, 215123, China.

Session HM-14	Multi-objective Evolutionary Algorithms
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 204
Chair	Adriana Menchaca / Jinliang Ding

- 2:30PM E-26016 Δ_p -MOEA: A New Multi-Objective Evolutionary Algorithm Based on the Δ_p Indicator 3753**
 Adriana Menchaca-Mendez, Carlos Hernández and Carlos A. Coello Coello
CINVESTAV-IPN, Departamento de Computación, Av. IPN 2508. San Pedro Zacatenco, México D.F. 07300, México

- 2:50PM** **E-16222** **Multiobjective Approach to the Vehicle Routing Problem with Demand Responsive Transport 3761**
Renan Santos Mendes¹, Dângelo Silva Miranda¹, Elizabeth Fialho Wanner², João F. M. Sarubbi² and Flávio V. C. Martins²
¹Programa de Pós-Graduação em, Modelagem Matemática e Computacional, CEFET, MG, Brazil; ²Departamento de Computação, CEFET, MG, Brazil.
- 3:10PM** **E-16730** **Reference Point Based Prediction for Evolutionary Dynamic Multiobjective Optimization 3769**
Cuie Yang¹, Jinliang Ding¹, Tianyou Chai¹ and Yaochu Jin²
¹State Key Laboratory of Synthetical Automation for Process Industries, Northeastern University, Shenyang, 110819, China; ²Department of Computer Science, University of Surrey, Guildford, GU2 7XH, UK.
- 3:30PM** **E-16801** **Fast Implementation of Steady-State NSGA-II 3777**
Sumit Mishra, Samrat Mondal and Sriparna Saha
Department of Computer Science and Engineering, Indian Institute of Technology Patna, Patna, 801103, India.
- 3:50PM** **E-26023** **Manifold Dimension Reduction based Clustering for Multi-Objective Evolutionary Algorithm 3785**
Yanan Sun¹, Gary G. Yen², Hua Mao¹ and Zhang Yi¹
¹College of Computer Science, Sichuan University, Chengdu, 610065, China; ²School of Electrical and Computer Engineering, Oklahoma State University, Stillwater, 74075, USA.

Session HM-15	SS CEC-06: Evolutionary Feature Selection and Construction
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 205
Chair	Bing Xue / Ben Niu

- 2:30PM** **E-16192** **Improving Generalisation of Genetic Programming for High-Dimensional Symbolic Regression with Feature Selection 3793**
Qi Chen¹, Bing Xue¹, Ben Niu² and Mengjie Zhang¹
¹School of Engineering and Computer Science, Victoria University of Wellington, PO Box 600, Wellington, 6400, New Zealand; ²College of Management, Shenzhen University, Shenzhen, Guangdong, 518060, China.
- 2:50PM** **E-16404** **A PSO Based Hybrid Feature Selection Algorithm for High-Dimensional Classification 3801**
Binh Tran, Mengjie Zhang and Bing Xue
School of Engineering and Computer Science, Victoria University of Wellington, PO Box 600, Wellington 6140, New Zealand.
- 3:10PM** **E-16666** **Bacterial-Inspired Feature Selection Algorithm and Its Application in Fault Diagnosis of Complex Structures 3809**
Hong Wang^{1,2}, Xingjian Jing^{1,2} and Ben Niu^{1,3}
¹Department of Mechanical Engineering, The Hong Kong Polytechnic University, Hong Kong, China; ²The Hong Kong Polytechnic University Shenzhen Research Institute, Shenzhen, China; ³College of Management, Shenzhen University, Shenzhen, China

- 3:30PM** **E-16552** **A Grouping Genetic Algorithm — Extreme Learning Machine Approach for Optimal Wave Energy Prediction 3817**
L. Cornejo-Bueno, A. Aybar-Ruiz, S. Jiménez-Fernández, E. Alexandre, J. C. Nieto-Borge and S. Salcedo-Sanz
Department of Signal Processing and Communications, Universidad de Alcalá, Madrid, Spain.
- 3:50PM** **E-17003** **Enhancing Discrimination Power with Genetic Feature Construction: A Grammatical Evolution Approach 3824**
Patrícia Miquilini¹, Rodrigo C. Barros², Vinícius V. de Melo¹ and Márcio P. Basgalupp¹
¹Universidade Federal de São Paulo, Instituto de Ciência e Tecnologia, São José dos Campos, SP, Brazil; ²Pontifícia Universidade Católica do Rio Grande do Sul, Faculdade de Informática, Porto Alegre, RS, Brazil.
- 4:10PM** **E-16275** **A Compact Firefly Algorithm for the Variable Selection Problem in Pharmaceutical Ingredient Determination 3832**
Lauro C. M. de Paula¹, Heber V. Nogueira¹, Anderson S. Soares¹, Telma W. de Lima¹ and Clarimar J. Coelho²
¹Institute of Informatics, Federal University of Goiás, Goiânia, Goiás, 74690-900, Brazil; ²School of Exact Science and Computing, Pontifical Catholic University of Goiás, Goiânia, Goiás, 74885-460, Brazil.

Session HM-16	SS CEC-04A: Evolutionary Computer Vision
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 206
Chair	Mengjie Zhang / Aldo Marquez-Grajales

- 2:30PM** **E-16530** **Figure-ground Image Segmentation using Genetic Programming and Feature Selection 3839**
Yuyu Liang, Mengjie Zhang and Will N. Browne
School of Engineering and Computer Science, Victoria University of Wellington, P.O. Box 600, Wellington 6140, New Zealand.
- 2:50PM** **E-16737** **Evolutionary Algorithms for Classification of Mammographic Densities using Local Binary Patterns and Statistical Features 3847**
Francine Burling-Claridge, Muhammad Iqbal and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.
- 3:10PM** **E-16984** **Automatic Blended Tone Mapping through Evolutionary Optimization 3855**
Xihe Gao, Stephen Brooks and Dirk V. Arnold
Faculty of Computer Science, Dalhousie University, Halifax, Nova Scotia, Canada.

- 3:30PM E-16990 Cervical Image Segmentation Using Active Contours and Evolutionary Programming Over Temporary Acetowhite Patterns 3863**
Aldo Márquez-Grajales¹, Hector-Gabriel Acosta-Mesa², Efrén Mezura-Montes² and Rodolfo Hernández-Jiménez³
¹Laboratorio Nacional de, Informática Avanzada, LANIA, Rébsamen 80, C.P. 91000 A.P. 696, Col. Centro, Xalapa, Veracruz, México; ²Artificial Intelligence Research Center, University of Veracruz, Sebastián Camacho 5, Col. Centro., Xalapa, Veracruz, México; ³Private Practice Diego Leño 22, Col. Centro, C.P. 91000, Xalapa, Veracruz, México.
- 3:50PM E-16952 An Evolutionary Algorithm for Depth Image Based Camera Pose Estimation in Indoor Environments 3871**
Ang Lu and Dirk V. Arnold
Faculty of Computer Science, Dalhousie University, Halifax, Nova Scotia, Canada.
- 4:10PM E-17085 A Hybrid Genetic Algorithm for Color Image Denoising 3879**
Daniel Fajardo-Delgado¹, María Guadalupe Sánchez¹, Jesús Ezequiel Molinar-Solis², José Alberto Fernández-Zepeda³, Vicente Vidal⁴ and Gumersindo Verdú⁵
¹Department of Systems and Computation, Instituto Tecnológico de Cd. Guzmán, Cd. Guzmán, Jal., 49000, Mexico; ²Department of Electric and Electronics, Instituto Tecnológico de Cd. Guzmán, Cd. Guzmán, Jal., 49000, Mexico; ³Department of Computer Science, Centro de Investigación Científica y de Educación Superior de Ensenada, Ensenada, BC, 22860, Mexico; ⁴Department of Informatics Systems and Computing, Universitat Politècnica de València, Valencia, 46022, Spain; ⁵Department of Chemical and Nuclear Engineering, Universitat Politècnica de València, Valencia, 46022, Spain.

Session HM-17	SS CEC-36B: Evolutionary Computation in Architectural Design
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 207
Chair	Fatih Tasgetiren / Onur Dursun

- 2:30PM E-17020 A Computational Intelligence Decision-Support Environment for Architectural and Building Design: CIDEA 3887**
Ioannis Chatzikonstantinou
Faculty of Architecture, Yaşar University, Izmir, Turkey and Department of Building Technology, Faculty of Architecture, TU Delft, Delft, The Netherlands.
- 2:50PM E-16991 Optimizing Natural Ventilation Strategy in Existing Buildings using Differential Evolution — Case of Architectural Studio Classrooms 3895**
Damla Elbi, Hüma Fulya Ekim and Onur Dursun
Department of Architecture, Yaşar University, İzmir, Turkey

- 3:10PM E-16618 Further Note on the Probabilistic Constraint Handling 3901**
 Özer Ciftcioglu¹, Michael S. Bittermann² and Rituparna Datta³
¹*Department of Architecture, Delft University of Technology, The Netherlands, Maltepe University, Maltepe — Istanbul, Turkey;* ²*Department of Architecture, Maltepe University, Maltepe-Istanbul, Turkey;* ³*Department of Mechanical Engineering, Indian Institute of Technology, Kanpur, Kanpur, Pin 208016, India.*
- 3:30PM E-16614 Visual Perception with Color for Architectural Aesthetics 3909**
 Michael S. Bittermann¹ and Özer Ciftcioglu²
¹*Department of Architecture, Maltepe University, Maltepe-Istanbul, Turkey;* ²*Department of Architecture, Delft University of Technology, The Netherlands, Maltepe University, Maltepe — Istanbul, Turkey.*
- 3:50PM E-16242 Multi-Objective Optimization for Shading Devices in Buildings by using Evolutionary Algorithms 3917**
 Ayca Kirimat¹, Basak Kundakci Koyunbaba¹, Ioannis Chatzikonstantinou², Sevil Sariyildiz² and Ponnuthurai Nagaratnam Suganthan³
¹*Yasar University, Department of Architecture, Izmir, Turkey;* ²*Yasar University, TU Delft, Department of Architecture, Chair of Design Informatics, Izmir, Turkey, Delft, The Netherlands;* ³*Nanyang Technological University, School of Electrical and Electronic Engineering, Singapore.*
- 4:10PM E-16961 Effects of Varying Input and Output Points on New Aisle Designs in Warehouses 3925**
 Ömer Öztürkoglu
Department of Industrial Engineering, Yasar University, Izmir, Turkey.

Session HM-18	SS CDCI-13B: Computational Intelligence in Power System / SS CEC-45: Evolutionary Computing Application in Hardware
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 208+209
Chair	Helton Alves / Andy M. Tyrrell

- 2:30PM E-17032 Optimal Placement of Capacitor Banks in Distorted Electrical Distribution Network Based on a Constrained Multi-objective Immune Algorithm 3933**
 Helton do Nascimento Alves
DEE — Federal Institute of Maranhão (IFMA), São Luis, MA, 65030-000, Brazil.
- 2:50PM E-17122 A Multiobjective Evolutionary Algorithm based on Decomposition for Unit Commitment Problem with Significant Wind Penetration 3939**
 Anupam Trivedi, Dipti Srinivasan, Kunal Pal and Thomas Reindl
National University of Singapore, Singapore.

- 3:10PM** **E-16873** **Harmony Search and Virus Optimization Algorithm for Multi-Objective Combined Economic Energy Dispatching Problems 3947**
 Yun-Chia Liang^{1,2} and Josue Rodolfo Cuevas Juarez^{1,3}
¹Department of Industrial Engineering and Management, Yuan Ze University, Taoyuan, Taiwan; ²Innovation Center for Big Data and Digital Convergence, Yuan Ze University, Taoyuan, Taiwan; ³Research and Development department, Algorithm Development Unit, MasterWork AoiTek Tech Corp. Ltd., Taipei, Taiwan.
- 3:30PM** **E-16398** **Optimal Installation of Multiple DG Units Using Competitive Swarm Optimizer (CSO) Algorithm 3955**
 R. Arulraj and N. Kumarappan
 Department of Electrical Engineering, Annamalai University, Annamalai Nagar, India.
- 3:50PM** **E-16967** **Drag Force Fault Extension to Evolutionary Model Consistency Checking for a Flapping-Wing Micro Air Vehicle 3961**
 John C. Gallagher¹, Monica Sam¹, Sanjay Boddhu¹, Eric T. Matson² and Garrison Greenwood³
¹Wright State University, Dayton, OH, USA; ²Purdue University, West Lafayette, IN, USA; ³Portland State University, Portland, OR, USA.

Session HP-12	Multiobjective Optimization / Learning Classifier Systems
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 202
Chair	Amilkar Yudier Puris Cáceres / Anis Yazidi

- 4:30PM** **E-16019** **Improving the IWFG Algorithm for Calculating Incremental Hypervolume 3969**
 Wesley Cox and Lyndon While
 School of Computer Science & Software Engineering, The University of Western Australia, Perth, 6009, Australia.
- 4:50PM** **E-16483** **An Effective PSO-TLBO Algorithm for multi-objective Optimization 3977**
 Tingli Cheng¹, Minyou Chen¹, Peter J. Fleming², Zhile Yang³ and Shaojun Gan³
¹School of Electrical Engineering, Chongqing University, Chongqing, China; ²Department of Automatic Control & System Engineering, University of Sheffield, Sheffield, UK; ³School of Electronics, Electrical Engineering and Computer Science, Queens University Belfast, Belfast, UK
- 5:10PM** **E-16154** **Learning Bayesian Network by a Mesh of Points 3983**
 Byron Oviedo¹, Luis Moreira¹, Amilkar Puris¹, Pavel Novoa¹ and Serafin Moral²
¹Universidad Técnica Estatal de Quevedo, Faculty of Engineering Sciences, Quevedo, Los Ríos, Ecuador, EC120508; ²Universidad de Granada, Granada, España, 18071.
- 5:30PM** **E-16931** **Interpolation-based Classifier Generation in XCSF 3990**
 Anthony Stein, Christian Eymüller, Dominik Rauh, Sven Tomforde and Jörg Hähner
 Organic Computing Group, University of Augsburg, Germany.

- 5:50PM** **E-16946** **Distributed Learning Automata for Solving a Classification Task** 3999
Morten Goodwin¹, Anis Yazidi² and Tore Møller Jonassen²
¹Department of Information and Communication Technology, University of Agder, Norway; ²Department of Computer Science, Oslo and Akershus University College of Applied Sciences, Norway
- 6:10PM** **E-17157** **An XCS-based Algorithm for Multi-Objective Reinforcement Learning** 4007
Xiu Cheng, Gang Chen and Mengjie Zhang
School of Engineering and Computer Science, Victoria University of Wellington, New Zealand.

Session HP-13	SS CEC-14: Fireworks Algorithm for Its Application on Big-Data
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 203
Chair	Ying Tan / Milan Tuba

- 4:30PM** **E-16186** **Enhancing Interaction in the Fireworks Algorithm by Dynamic Resource Allocation and Fitness-Based Crowdedness-Avoiding Strategy** 4015
Junzhi Li and Ying Tan
Key Laboratory of Machine Perception (Ministry of Education), Department of Machine Intelligence, School of Electronics Engineering and Computer Science, Peking University, Beijing, 100871, P.R. China
- 4:50PM** **E-16485** **Route Planning in a New Tourist Recommender System: a Fireworks Algorithm Based Approach** 4022
Hui Ding¹, Liangjun Ke¹ and Zihao Geng²
¹State Key Laboratory for Manufacturing System Engineering, Xi'an Jiaotong University; ²School of Computer and Information Technology, Beijing Jiaotong University, China
- 5:10PM** **E-16696** **Fireworks Algorithm for the Satellite Link Scheduling Problem in the Navigation Constellation** 4029
Tianjiao Zhang¹, Liangjun Ke², Jisheng Li³, Jing Li³, Zexi Li³ and Jingqi Huang³
¹State key Laboratory of Astronautic Dynamics, Xi'an Satellite Control Center and System Engineering Institute, Xi'an Jiaotong University, Xi'an, 710043, China; ²State Key Laboratory for Manufacturing Systems Engineering, Xi'an Jiaotong University, Xi'an, 710043, China; ³State key Laboratory of Astronautic Dynamics, Xi'an Satellite Control Center, Xi'an, 710049, China
- 5:30PM** **E-17009** **Fireworks Algorithm Applied to Wireless Sensor Networks Localization Problem** 4038
Aleksandra Arsic¹, Milan Tuba² and Milos Jordanski¹
¹Faculty of Mathematics, University of Belgrade, Belgrade, Serbia; ²Faculty of Computer Science, John Naisbitt University, Belgrade, Serbia.
- 5:50PM** **E-16960** **Enhancing Fireworks Algorithms for Dynamic Optimization Problems** 4045
Hakan Pekdemir and Haluk Rahmi Topcuoglu
Computer Engineering Department, Faculty, of Engineering, Marmara University, Goztepe Kampusu, Kuyubasi, Istanbul, 34722, Turkey.

6:10PM **E-16416** **Fuzzy FWA with Dynamic Adaptation of Parameters 4053**
 Juan Barraza, Patricia Melin, Fevrier Valdez and Claudia I. Gonzalez
Tijuana Institute of Technology, Tijuana, Mexico.

Session HP-14	Differential Evolution
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 204
Chair	Ji Qiang / Aluizio Araujo

4:30PM **E-16738** **Tuning of an Adaptive Unified Differential Evolution Algorithm for Global Optimization 4061**
 Ji Qiang¹, Chad Mitchell¹ and Albert Qiang²
¹Lawrence Berkeley National Laboratory, Berkeley, USA; ²Campolindo High School, Moraga, USA.

4:50PM **E-16837** **Searching a Probabilistic Model for Differential Evolution Population 4069**
 P. Elaine Guerrero, Wagner J. F. Silva and Aluizio F. R. Araujo
Informatics Center, Federal University of Pernambuco, Recife, Brazil.

5:10PM **E-26036** **Enhancing Exploration in Differential Evolution via Exponential Recombination 4076**
 Xin Qiu¹, Jianxin Xu¹ and Kay Chen Tan¹
¹NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore, 119077, Singapore; ²Department of Electrical and Computer Engineering, National University of Singapore, 119077, Singapore.

5:30PM **E-16234** **QUasi-Affine TRansformation Evolutionary (QUATRE) algorithm: A Parameter-reduced Differential Evolution Algorithm for Optimization Problems 4082**
 Zhenyu Meng¹ and Jeng-Shyang Pan^{1,2}
¹Department of Computer Science and Technology, Shenzhen Graduate School, Harbin Institute of Technology, Shenzhen, 518055, China; ²College of Information Science and Engineering, Fujian University of Technology, Fuzhou, 350000, China.

5:50PM **E-16910** **Enhancing Distributed Differential Evolution with a Space-Driven Topology 4090**
 Yong-Feng Ge¹, Wei-Jie Yu², Jing-Jing Li³, Zhi-Wen Yu^{4,5} and Jun Zhang^{4,5}
¹School of Data and Computer Science, Sun Yatsen University, Guangzhou, 510275, China; ²School of Information Management, Sun Yat-sen University, Guangzhou, 510275, China. ³School of Computer, South China Normal University, Guangzhou, 510631, China; ⁴School of Computer Science and Engineering, South China University of Technology, Guangzhou 510641, China; ⁵State Key Laboratory of Mathematical Engineering and Advanced Computing, China.

6:10PM **E-17186** **An Opposition-Based Self-adaptive Differential Evolution with Decomposition for Solving the Multiobjective Multiple Salesman Problem** 4096
 Jin Kiat Chong and Xin Qiu
Department of Electrical and Computer Engineering, National University of Singapore, 119077, Singapore.

Session HP-15	Genetic Algorithms / SS CEC-49: Genetic Improvement of Software + Search-Based Software Engineering (GI+SBSE)
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 205
Chair	João Bertini / Markus Wagner

4:30PM **E-16706** **A Genetic Algorithm for Improving the Induction of Attribute-based Decision Graph Classifiers** 4104
 João Roberto Bertini Junior¹ and Maria do Carmo Nicoletti²
¹*C.S. Department — UFSCar, S. Carlos, SP, Brazil;* ²*C.S. Department — UFSCar & FACCAMP, S. Carlos & C. L. Paulista, SP, Brazil.*

4:50PM **E-17065** **An Empirical Study of Crossover and Mass Extinction in a Genetic Algorithm for Pathfinding in a Continuous Environment** 4111
 H. David Mathias and Vincent R. Ragusa
Department of Mathematics & Computer Science, Florida Southern College, Lakeland, Florida 33801.

5:10PM **E-17150** **A Multi-Population Memetic Algorithm for Dynamic Shortest Path Routing in Mobile Ad-hoc Networks** 4119
 Ayad Turkey, Nasser R. Sabar and Andy Song
School of Computer Science and Information Technology, RMIT University, Australia.

5:30PM **E-16152** **Solar Flare Prediction by SVM Integrated GA** 4127
 Yukiko Yamamoto¹, Setsuo Tsuruta¹, Takayuki Muranushi², Yuko Hada-Muranushi³, Syoji Kobashi⁴, Yoshiyuki Mizuno⁵ and Rainer Knauf⁶
¹*School of Information Environment, Tokyo Denki University, Inzai, Japan;* ²*RIKEN Advanced Institute for Computational Science, 7-1-26, Minatojima-minami-machi, Chuo-ku, Kobe, Hyogo, 650-0047, Japan;* ³*Kwasan and Hida Observatories, Kyoto University, Yamashina-ku, Kyoto 607-8471, Japan;* ⁴*Graduate School of Engineering, University of Hyogo, Himeji, 671-2280, Japan;* ⁵*Faculty of Modern Sociology, Kyoto Women's University, Kyoto, Japan;* ⁶*Faculty of Computer Science and Automation, Ilmenau University of Technology, Ilmenau, Germany.*

- 5:50PM** **E-16364** **Product Selection Based on Upper Confidence Bound MOEA/D-DRA for Testing Software Product Lines 4135**
Thiago do Nascimento Ferreira, Josiel Neumann Kuk, Aurora Pozo and Silvia Regina Vergilio
DInf— Federal University of Paraná, CP: 19081, CEP: 81.531-980, Curitiba, Brazil.
- 6:10PM** **E-16921** **Automatic Lock-free Parallel Programming on Multi-core Processors 4143**
Gopinath Chennupati, R. Muhammad Atif Azad and Conor Ryan
Bio-Computing and Developmental Systems Group, Computer Science and Information Systems Department, University of Limerick, Ireland.

Session HP-16	SS CEC-04B: Evolutionary Computer Vision / SS CEC-03: Nature-Inspired Constrained Single- and Many-Objective Optimization
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 206
Chair	Efren Mezura-Montes / Dymitr Ruta

- 4:30PM** **E-16179** **Object-tracking based on Particle Filter using Particle Swarm Optimization with Density Estimation 4151**
Gongyi Xia and Simone A. Ludwig
North Dakota State University, Fargo, ND, USA.
- 4:50PM** **E-16867** **Cost Effective, Scalable Design of Indoor Distributed Antenna Systems Based on Particle Swarm Optimization and Prufer Strings 4159**
Dina Y. Atia^{1,2}, Dymitr Ruta², Kin Poon², Anis Ouali² and A. F. Isakovic³
¹Khalifa University of Science, Technology and Research (KUSTAR), Abu Dhabi, UAE; ²Etisalat British Telecom Innovation Centre, KUSTAR, Abu Dhabi UAE.
- 5:10PM** **E-16493** **Towards an Improvement of Variable Interaction Identification for Large-Scale Constrained Problems 4167**
Adan E. Aguilar-Justo and Efrén Mezura-Montes
Artificial Intelligence Research Center, University of Veracruz, Sebastián Camacho 5, Centro, Xalapa, Veracruz, 91000, México.
- 5:30PM** **E-16447** **A Comparative Study of Constraint-Handling Techniques in Evolutionary Constrained Multiobjective Optimization 4175**
Jia-Peng Li¹, Yong Wang^{1,2}, Shengxiang Yang² and Zixing Cai¹
¹School of Information Science and Engineering, Central South University, Changsha 410083, China; ²School of Computer Science and Informatics, De Montfort University, Leicester LE1 9BH, UK.
- 5:50PM** **E-17081** **μJADEε: Micro Adaptive Differential Evolution to Solve Constrained Optimization Problems 4183**
Aldo Márquez-Grajales and Efrén Mezura-Montes
Artificial Intelligence Research Center, University of Veracruz, Sebastián Camacho 5, Xalapa, Veracruz, 91000, México.

6:10PM **E-26017** **Enhanced Multi-operator Differential Evolution for Constrained Optimization 4191**
 Saber Elsayed¹, Ruhul Sarker¹ and Carlos Coello Coello²
¹*School of Engineering and Information Technology, University of New South Wales at Canberra, Canberra 2600, Australia;* ²*Depto. de Computación, CINVESTAV-IPN, Mexico.*

Session HP-17	SS CEC-36C: Evolutionary Computation in Architectural Design / Ant Colony Optimization
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 207
Chair	Essamudin Ebrahim / Rolf Dornberger

4:30PM **E-17012** **Impacts of Problem Scale and Sampling Strategy on Surrogate Model Accuracy — An Application of Surrogate-based Optimization in Building Design 4199**
 Ding Yang^{1,2}, Yimin Sun^{1,3}, Danilo di Stefano⁴, Michela Turrin^{1,3} and Sevil Sariyildiz^{2,5}
¹*School of Architecture, South China University of Technology, Guangzhou, China;* ²*Faculty of Architecture and the Built Environment, Delft University of Technology, Delft, The Netherlands;* ³*State Key Laboratory of Subtropical Building Science, South China University of Technology, Guangzhou, China;* ⁴*ESTECO, Trieste, Italy;* ⁵*Faculty of Architecture, Yaşar University, Izmir, Turkey.*

4:50PM **E-16987** **Optimizing Wall Insulation Material Parameters in Renovation Projects using NSGA-II 4208**
 Hızır Gökhan Uyduran, Orçun Koral İşeri, Yarkın Üstünes and Onur Dursun
Faculty of Architecture, Yaşar University, İzmir, Turkey.

5:10PM **E-16130** **fairGhosts — Ant Colony Controlled Ghosts for Ms. Pac-Man 4214**
 Iris Hunkeler¹, Fabian Schär¹, Rolf Dornberger² and Thomas Hanne¹
¹*Institute for Information Systems, School of Business, University of Applied Sciences and Arts, Northwestern Switzerland, Olten, Switzerland;* ²*Institute for Information Systems, School of Business, University of Applied Sciences and Arts, Northwestern Switzerland, Basel, Switzerland.*

5:30PM **E-16502** **Ant-Colony Optimization Control of Brushless-DC Motor Driving a Hybrid Electric-Bike and Fed from Photovoltaic Generator 4221**
 Essamudin A. Ebrahim
Power Electronics and Energy Conversion Department, Electronics Research Institute, El-tahrir Street, 12622 Dokki, Cairo, Egypt

5:50PM **E-16917** **Exploratory Path Planning Using the Max-Min Ant System Algorithm 4229**
 Valéria de C. Santos¹, Fernando S. Osório¹, Cláudio F. M. Toledo¹, Fernando E. B. Otero² and Colin G. Johnson²
¹*Institute of Mathematics and Computer Sciences, University of São Paulo, São Carlos, Brazil;* ²*School of Computing, University of Kent, Canterbury, United Kingdom.*

6:10PM E-16360 A Hybrid ACO Algorithm Based on Bayesian Factorizations and Reinforcement Learning for Continuous Optimization 4236
 Qishuai Liu and Qing Hui
Department of Electrical and Computer, Engineering, University of Nebraska-Lincoln, Lincoln, NE 68588-0511, USA.

Session HP-18	SS CDCI-19: Computational Intelligence in Biometrics and Biometrics Applications / SS CEC-29: Evolutionary Computation for Computational Biology
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 208+209
Chair	Qinghan Xiao / Anirban Mukhopadhyay

4:30PM E-16259 Sparse Representation Classification based on Difference Subspace 4244
 Qi Zhu¹, Qingxiang Feng², Jiashuang Huang¹ and Dan Zhang¹
¹College of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics, Nanjing, China; ²Shenzhen Graduate School Harbin Institute of Technology, Shenzhen, China

4:50PM E-16303 Discriminative Sparsity Preserving Graph Embedding 4250
 Jianping Gou¹, Lan Du², Keyang Cheng¹ and Yingfeng Cai³
¹School of Computer Science and Telecommunication Engineering, JiangSu University, ZhenJiang, JiangSu, 212013, P.R. China; ²Faculty of Information Technology, Monash University, Clayton, VIC 3800, Australia; ³School of Automotive Engineering Research Institute, JiangSu University, ZhenJiang, JiangSu, 212013, P.R. China.

5:10PM E-16432 Multispectral Hand Recognition Using the Kinect v2 Sensor 4258
 S. Samoil and S. N. Yanushkevich
Department of Electrical and Computer Engineering, Biometric Technologies Laboratory, University of Calgary, 2500 University Drive NW, Calgary, Alberta, T2N 1N4, Canada.

5:30PM E-16945 Towards Touchless Pore Fingerprint Biometrics: A Neural Approach 4265
 Angelo Genovese, Enrique Muñoz, Vincenzo Piuri, Fabio Scotti, Gianluca Sforza
Department of Computer Science, Università degli Studi di Milano, Italy.

5:50PM E-17054 Optimization of Artificial Operon Construction by Consultation Algorithms Utilizing LCS 4273
 Changhee Han¹, Kenji Tsuge² and Hitoshi Iba¹
¹Graduate School of Information Science and Technology, The University of Tokyo, Bunkyo, Tokyo, Japan; ²Institute for Advanced Biosciences, Keio University, Tsuruoka, Yamagata, Japan.

6:10PM E-17023 Neutral Space Analysis of Gene Regulatory Network Models of Salt Stress Response in Arabidopsis Using Evolutionary Computation 4281
 Gonzalo A. Ruz, Tania Timmermann and Eric Goles
¹Facultad de Ingeniería y Ciencias, Universidad Adolfo Ibáñez, Av. Diagonal Las Torres 2640, Santiago, Chile; ²Center of Applied Ecology and Sustainability (CAPES), Santiago, Chile

Session FA-12	Parallel and Distributed Algorithms / Convergence, Scalability and Complexity Analysis
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 202
Chair	Sriparna Saha / Steffen Finck

- 8:00AM** **E-16141** **Multi Operators-based Partial Connected Parallel Evolutionary Algorithm 4289**
Yuanjun Laili, Fei Tao and Lin Zhang
School of Automation Science and Electrical Engineering, Beihang University, Beijing 100191, P.R. China.
- 8:20AM** **E-16796** **Divide and Conquer Based Non-dominated Sorting for Parallel Environment 4297**
Sumit Mishra, Sriparna Saha and Samrat Mondal
Department of Computer Science and Engineering, Indian Institute of Technology Patna, Patna, 801103, India.
- 8:40AM** **E-16983** **A Successful Parallel Implementation of NSGA-II on GPU for the Energy Dispatch Problem on Hydroelectric Power Plants 4305**
Lucas Braga de Oliveira¹, Carolina G. Marcelino¹, Anolan Milanés¹, Paulo E. M. Almeida¹ and Leonel M. Carvalho²
¹*Computer Engineering Department, CEFET-MG, Belo Horizonte, Brasil;*
²*Centre for Power and Energy Systems — CPES, INESC TEC — Portugal.*
- 9:00AM** **E-16248** **Analysis of Simple Pattern Search on the Noisy Sphere Model 4313**
Steffen Finck
Josef Ressel Center for Applied Scientific Computing in Energy, Finance and Logistics, FH Vorarlberg University of Applied Sciences, 6850 Dornbirn, Austria.
- 9:20AM** **E-16694** **Proposal of Search Based on a User's Preference Direction Using Reference Lines 4321**
Toshihiro Kishigami and Tomohiro Yoshikawa
Graduate School of Engineering, Nagoya University, Japan.

Session FA-13	Meta-modeling and Surrogate Models / SS CEC-55: Multiobjective Optimization with Surrogate Models
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 203
Chair	Tapabrata Ray / Bogdan Filipic

- 8:00AM** **E-16059** **Multiple Surrogate Assisted Multiobjective Optimization using Improved Pre-selection** 4328
Kalyan Shankar Bhattacharjee¹, Hemant Kumar Singh¹, Tapabrata Ray¹ and Juergen Branke²
¹*School of Engineering and Information Technology, The University of New South Wales, Australia;* ²*Warwick Business School, University of Warwick, UK.*
- 8:20AM** **E-16429** **A Multi-objective Batch Infill Strategy for Efficient Global Optimization** 4336
Ahsanul Habib, Hemant Kumar Singh and Tapabrata Ray
School of Engineering and Information Technology, University of New South Wales, Australia.
- 8:40AM** **E-16350** **Ensemble of Surrogates Based on Error Classification by Unsupervised Learning** 4344
Yi Zhang, Xiaoqian Chen, Ning Wang, Wen Yao and Bingxiao Du
College of Aerospace Science and Engineering, National University of Defense Technology, Changsha, Hunan, China
- 9:00AM** **E-16718** **Truncated Expected Hypervolume Improvement: Exact Computation and Application** 4350
Kaifeng Yang, André Deutz, Zhiwei Yang, Thomas Bäck and Michael Emmerich
Leiden Institute of Advanced Computer Science, Leiden University, Leiden, 2333 CA, The Netherlands.
- 9:20AM** **E-17169** **Study of the Approximation of the Fitness Landscape and the Ranking Process of Scalarizing Functions for Many-objective Problems** 4358
Gregorio Toscano¹ and Kalyanmoy Deb²
¹*CINVESTAV-Tamaulipas, Cd. Victoria, Tamaulipas, 87130, Mexico;* ²*Michigan State University, East Lansing, MI, USA.*

Session FA-14	SS CEC-37: Theoretical Foundations of Bio-inspired Computation / SS CEC-33: Evolutionary Algorithms for Mixed-Integer Optimization Problems / SS CEC-48: Hybrid Cultural Algorithms: Beyond Classical Cultural Algorithms
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 204
Chair	Pietro S. Oliveto / Martin Schlueter / Robert G. Reynolds

- 8:00AM** **E-16421** **An Analytic Expression of Relative Approximation Error for a Class of Evolutionary Algorithms 4366**
Jun He
Department of Computer Science, Aberystwyth University, Aberystwyth SY23 3DB, United Kingdom.
- 8:20AM** **E-16492** **On Sampling-and-Classification Optimization in Discrete Domains 4374**
Hong Qian and Yang Yu
National Key Laboratory for Novel Software Technology, Nanjing University, Nanjing 210023, China.
- 8:40AM** **E-16617** **Learning and Exploiting Mixed Variable Dependencies with a Model-Based EA 4382**
Krzysztof L. Sadowski¹, Peter A. N. Bosman² and Dirk Thierens¹
¹*Utrecht University, Department of Computer Science, Utrecht, The Netherlands;* ²*Centrum Wiskunde & Informatica (CWI), Amsterdam, The Netherlands.*
- 9:00AM** **E-16427** **Extension and Performance Evaluation of Recent Optimization Techniques on Mixed Integer Optimization Problems 4390**
Varun Punnathanam, Remya Kommadath and Prakash Kotecha
Department of Chemical Engineering, Indian Institute of Technology, Guwahati, India.
- 9:20AM** **E-16151** **Heritage-Dynamic Cultural Algorithm for Multi-Population Solutions 4398**
Andrew William Hlynka and Ziad Kobti
School of Computer Science, University of Windsor, Windsor, Ontario, Canada.
- 9:40AM** **E-17126** **A Study on Population Adaptation in Social Networks based on Knowledge Migration in Cultural Algorithm 4405**
Pooya Moradian Zadeh, Mukund Pandey and Ziad Kobti
School of Computer Science, University of Windsor, Windsor, Ontario, Canada

Session FA-15	Emerging Areas / SS CEC-53: Multi-Fidelity Design Optimization under Epistemic Uncertainties
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 205
Chair	Dipti Srinivasan / Hou Liqiang

- 8:00AM** **E-16704** **A Vehicle-to-Grid Based Reactive Power Dispatch Approach Using Particle Swarm Optimization 4413**
Wenjie Zhang, Pritam Das and Dipti Srinivasan
Department of Electrical and Computer Engineering, National University of Singapore, 117576, Singapore
- 8:20AM** **E-16813** **Automatically Proving Mathematical Theorems with Evolutionary Algorithms and Proof Assistants 4421**
Li-An Yang, Jui-Pin Liu, Chao-Hong Chen and Ying-ping Chen
Department of Computer Science, National Chiao Tung University, HsinChu City, Taiwan.
- 8:40AM** **E-17133** **An Exploration of Grammatical Encodings to Model Six Nations Rugby Match Outcomes 4429**
Michael O’Neill, Anthony Brabazon and David Fagan
Natural Computing Research & Applications Group, UCD Business, University College Dublin, Ireland.
- 9:00AM** **E-17145** **Evolving Construction Heuristics for the Curriculum Based University Course Timetabling Problem 4437**
Nelishia Pillay
School of Mathematics, Statistics and Computer Science, University of KwaZulu-Natal, South Africa.
- 9:20AM** **E-16510** **Multi-fidelity Adaptive Global Metamodel of Expensive Computer Simulations 4444**
Riccardo Pellegrini¹, Umberto Iemma¹, Cecilia Leotardi², Emilio F. Campana² and Matteo Diez²
¹*Department of Engineering, Roma Tre University, Rome, Italy;* ²*INSEAN—Marine Technology Research Institute, CNR–National Research Council, Rome, Italy.*
- 9:40AM** **E-16772** **Multi-Fidelity Design Optimization under Epistemic Uncertainty 4452**
Liqiang Hou¹, Wei Tan² and Hong Ma²
¹*State Key Laboratory of Astronautic Dynamics, Xi’an Satellite Control Center, Xi’an, 710043, China;* ²*Xi’an Satellite Control Center, Xi’an, 710043, China*

Session FA-16	SS CDCI-20: Computational Intelligence Algorithms in Wireless Sensor Networks / SS CEC-54: Geometrical and Topological Methods in Evolutionary Computing
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 206
Chair	Anil Kumar / Vaclav Snasel

- 8:00AM E-16024 Computational Intelligence based Metaheuristic for Energy-Efficient Routing in Wireless Sensor Networks 4460**
Palvinder Singh Mann¹, Satvir Singh² and Anil Kumar³
¹Punjab Technical University, Kapurthala, Punjab, 144008, India; ²SBS State Technical Campus, Ferozepur, Punjab, 152004, India; ³Jaypee Institute of Information Technology, Noida, 201304, India.
- 8:20AM E-17025 Sensor Control for Temporal Coverage Optimization 4468**
Vahab Akbarzadeh, Christian Gagné and Marc Parizeau
Laboratoire de vision et systèmes numériques, Département de génie électrique et de génie informatique, Université Laval, Québec (Quebec), G1V 0A6, Canada.
- 8:40AM E-17006 Reliable Multiple Robot-Assisted Sensor Relocation using Multi-Objective Optimization 4476**
Benjamin Desjardins¹, Rafael Falcon², Rami Abielmona² and Emil Petriu¹
¹School of Electrical Engineering & Computer Science, University of Ottawa, Ottawa, ON, K1N 6N5, Canada; ²Research & Engineering, Division, Larus Technologies Corporation, Ottawa, ON, K1P 5V5, Canada.
- 9:00AM E-16902 Genetic Algorithm for Entropy-based Feature Subset Selection 4486**
Pavel Krömer and Jan Platoš
Department of Computer, Science, VŠB-Technical University of Ostrava, Ostrava, Czech Republic.
- 9:20AM E-16619 On Performance Improvement of the SOMA Swarm Based Algorithm and its Complex Network Duality 4494**
Lukas Tomaszek and Ivan Zelinka
Department of Computer Science, FEI, VSB Technical University of Ostrava, Tr. 17. Listopadu 15, Ostrava, Czech Republic

Session FA-17	Intelligent Systems Applications / SS CDCI-22: Intelligent Control of Unmanned Surface Vehicles / Autonomous Mental Development, Coevolution and Collective Behavior
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 207
Chair	Toshio Kodama / Meng Joo Er

- 8:00AM E-16011 A Case Study of Homotopic BOM Information Management Using the Cellular Data System 4501**
Toshio Kodama¹, Toshiyasu L. Kunii² and Yoichi Seki³
¹CDS Business Department, Maeda Corporation, Tokyo, Japan; ²Morpho Inc. and Univ. of Tokyo, Tokyo, Japan. kunii@ieee.org; ³Software Consultant, Tokyo, Japan.
- 8:20AM E-16680 A Hybrid Approach for Test Case Prioritization and Selection 4508**
Dennis Silva¹, Ricardo Rabelo¹, Matheus Campanhã¹, Pedro Santos Neto¹, Pedro Almir Oliveira² and Ricardo Britto³
¹Universidade Federal do Piauí, Departamento de Computação, Teresina, Piauí, Brasil; ²Instituto Federal do Maranhão, Pedreiras, Maranhão, Brazil; ³Department of Software Engineering, Blekinge Institute of Technology, Karlskrona, Sweden.
- 8:40AM E-16776 FPGA Implementation of Improved Ant Colony Optimization Algorithm for Path Planning 4516**
Chen-Chien Hsu¹, Wei-Yen Wang¹, Yi-Hsing Chien¹, Ru-Yu Hou¹ and Chin-Wang Tao²
¹Department of Electrical Engineering, National Taiwan Normal University, Taipei, Taiwan, R.O.C; ²Department of Electrical Engineering, National Ilan University, Yilan, Taiwan, R.O.C.
- 9:00AM E-16787 Improved Monte Carlo Localization with Robust Orientation Estimation based on Cloud Computing 4522**
Chung-Ying Li¹, I-Hsum Li², Yi-Hsing Chien¹, Wei-Yen Wang¹ and Chen-Chien Hsu¹
¹Department of Electrical Engineering, National Taiwan Normal University, Taipei, Taiwan, R.O.C; ²Department of Information Technology, Lee-Ming Institute of Technology, Taipei, Taiwan, R.O.C.
- 9:20AM E-16927 Extending the Nelder-Mead Algorithm for Feature Selection from Brain Networks 4528**
Reshma Kar¹, Amit Konar¹, Aruna Chakraborty², Anca L. Ralescu³ and Atulya K. Nagar⁴
¹Jadavpur University, Kolkata, India; ²St. Thomas College of Engineering & Technology, Kolkata, India; ³University of Cincinnati, USA; ⁴Liverpool Hope University, Liverpool, UK.

9:40AM E-16343 Co-Evolutionary Path Optimization by Ripple-Spreading Algorithm 4535
 Xiao-Bing Hu¹ and Jian-Qin Liao²
¹*Academy of Disaster Reduction and Emergence Management, Beijing Normal University, Beijing, China;* ²*Chengdu MiidShare Technology Ltd, Chengdu, China*

Session FA-18	SS CDCI-28: Applied Computational Intelligence for the Economics of Financial Market Infrastructures / SS CDCI-06: Computational Intelligence for Music, Art, and Creativity
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 208+209
Chair	Biliana Alexandrova-Kabadjova / Chuan-Kang Ting

8:00AM E-16217 Equilibrium Interbank Lending Networks 4543
 Di Xiao and Andreas Krause
University of Bath, Department of Economics, Bath BA2 7AY, Great Britain.

8:20AM E-16852 A Colored Petri Net for Stock Trading Signal Detection 4551
 Po-Yuan Shih¹, Dong-Her Shih² and An-Chung Liu²
¹*Department of Finance, National Chung Cheng University, Min-Hsiung, Chia-yi, Taiwan;* ²*Department of Information Management, National Yunlin University of Science and Technology, Douliu, Yunlin, Taiwan.*

8:40AM E-16110 Modifying the Fitness Function During the Use of an Evolutionary Algorithm for Design 4555
 Andrés Gómez de Silva Garza
Computer Engineering Department, Instituto Tecnológico Autónomo de México (ITAM), México, D.F., México.

9:00AM E-16452 Evolved Deflection Drawings 4562
 Gary Greenfield
Mathematics & Computer Science, University of Richmond, Richmond, 23173, Virginia.

9:20AM E-16453 Analysing Creative Models based on Unplugged Evolutionary Algorithms 4570
 Lilian Navarro Moreno¹, Francisco Fernández de Vega¹, Cayetano José Cruz García¹, Patricia Hernández Rondán² and José Vicente Albarrán Fernández¹
¹*Centro Universitario de Mérida, Universidad de Extremadura, Mérida, Badajoz, España;* ²*Facultad de Bellas Artes, Universidad de Sevilla, Sevilla, España.*

Session	[Plenary] – Decision-Maker Swarms, Prof. Sanaz Mostaghim
Date/Time	Friday, 29 July 2016 / 1:00PM – 2:00PM
Venue	Room Ballroom C
Chair	Hisao Ishibuchi

Session	Poster – CEC Poster Session
Date/Time	Friday, 29 July 2016 / 2:00PM – 6:00PM
Venue	Room Ballroom D
Chair	Laszlo Kockzy

- P501** **E-16196** **Wind Speed Prediction Using a Cooperative Coevolution Genetic Algorithm Based on Back Propagation Neural Network 4578**
 Jie Li¹, Rui Wang¹ and Tao Zhang^{1,2}
¹College of Information System and Management, National University of Defense Technology, Changsha, P.R. China; ²State Key Laboratory of High Performance Computing, National University of Defense Technology, Changsha, P.R. China.
- P502** **E-16969** **A Genetic Algorithm for Feature Selection in Gait Analysis 4584**
 Rosa Altilio¹, Luca Liparulo¹, Andrea Proietti¹, Marco Paoloni² and Massimo Panella¹
¹Department of Information Engineering, Electronics and Telecommunications (DIET), University of Rome “La Sapienza”, Via Eudossiana 18, 00184 Rome, Italy; ²Biomechanics and Movement Analysis Laboratory, Physical Medicine and Rehabilitation, University of Rome “La Sapienza”, P.le Aldo Moro 5, 00185 Rome, Italy.
- P503** **E-17005** **Optimizing Acceptance Frontier using PSO and GA for Multiple Signature Iris Recognition 4592**
 Gladston Moreira¹, Eduardo Luz¹ and David Menotti²
¹Computing Department, Universidade Federal de Ouro Preto, Ouro Preto, 35400-000, Brazil; ²Department of Informatics, Universidade Federal do Paraná, Curitiba, 81531-990, Brazil.
- P504** **E-16450** **Image Classification with Stacked Restricted Boltzmann Machines and Evolutionary Function Array Classification Voter 4599**
 Siyi Chen, Gang Liu, Cong Wu, Zhichen Jaing and Jie Chen
School of Computer Science, Hubei University of Technology, Wuhan, China.

- P505** **E-16855** **Self-adaptive Spectral Cluster Number Detecting with Particle Swarm Optimization Algorithm 4607**
 Chupeng Zeng, Aimin Zhou and Guixu Zhang
Shanghai Key Laboratory of Multidimensional Information Processing, Department of Computer Science and Technology, East China Normal University, 500 Dongchuan Road, Shanghai, China.
- P506** **E-16735** **Feature Selection Approach based on Moth-Flame Optimization Algorithm 4612**
 Hossam M. Zawbaa^{1,2}, E. Emary^{3,4}, B. Parv¹ and Marwa Sharawi⁴
¹*Faculty of Mathematics and Computer Science, Babes-Bolyai University, Romania;* ²*Faculty of Computers and Information, Beni-Suef University, Egypt;* ³*Faculty of Computers and Information, Cairo University, Egypt;* ⁴*Faculty of Computer Studies, Arab Open University, Cairo, Egypt*
- P507** **E-16351** **On the Role of Degree Influence in Suboptimal Modularity Maximization 4618**
 Rafael de Santiago and Luís C. Lamb
Institute of Informatics, Federal University of Rio Grande do Sul, Porto Alegre, RS, 91501-970, Brazil.
- P508** **E-16204** **Automatic Modulation Classification with Genetic Backpropagation Neural Network 4626**
 Qianlin Zhou, Hui Lu, Liwei Jia and Kefei Mao
Electronic and Information Engineering, Beihang University, Beijing, 100191, P.R. China.
- P509** **E-16780** **Heuristic Search Towards the Invention of an Optimal-Ignition Internal Combustion Engine 4634**
 Wuqiao Luo¹, Christoph Schöning¹, Lin Li² and Yun Li³
¹*School of Engineering, University of Glasgow, Glasgow, G12 8LT, U.K.;* ²*Department of Information and Communication Engineering, Harbin Engineering University, Harbin, China;* ³*School of Engineering, University of Glasgow, U.K.*
- P510** **E-16274** **Multiobjective Wind Driven Optimization Approach Applied to Transformer Design 4642**
 Helon Vicente Hultmann Ayala¹, Emerson Hochsteiner de Vasconcelos Segundo², Luiz Lebensztajn³, Viviana Cocco Mariani⁴ and Leandro dos Santos Coelho⁵
¹*Pós-Graduação em Engenharia de Produção e Sistemas, PPGEPS, Pontifícia Universidade Católica do Paraná, PUCPR, Curitiba, Brazil;* ²*Pós-Graduação em Engenharia Mecânica, PPGEM, Pontifícia Universidade Católica do Paraná, PUCPR, Curitiba, Brazil;* ³*Laboratório de Eletromagnetismo Aplicado, LMAG-PEA, Universidade de São Paulo, USP, São Paulo, Brazil;* ⁴*Pós-Graduação em Engenharia Mecânica, PPGEM, Pontifícia Universidade Católica do Paraná, Departamento de Engenharia Elétrica, Universidade Federal do Paraná, UFPR, Curitiba, Brazil;* ⁵*Pós-Graduação em Engenharia de Produção e Sistemas, PPGEPS, Pontifícia Universidade Católica do Paraná, Departamento de Engenharia Elétrica, Universidade Federal do Paraná, UFPR, Curitiba, Brazil*

- P511** **E-16972** **Metaheuristic Based Battery Control Optimization of a Photovoltaic System with Grid Connection 4648**
 Jean Meunier^{1,2}, Julien Rohmer^{1,2}, Dominique Knittel^{1,2} and Pierre Collet³
¹University of Strasbourg, Faculty of Physics and Engineering, 3 rue de l'Université, 67000 Strasbourg, France; ²INSA Strasbourg, Laboratoire du Génie de la Conception, 24 boulevard de la Victoire, 67084 Strasbourg, France; ³University of Strasbourg, Institute of Mathematics and Computer science, 7 rue René Descartes, 67084 Strasbourg, France
- P512** **E-16823** **Neuro-evolutionary System for FOREX Trading 4654**
 Jacek Mańdziuk^{1,2} and Piotr Rajkiewicz³
¹Faculty of Mathematics and Information Science, Warsaw University of Technology, Poland; ²School of Computer Science and Engineering, Nanyang Technological University, Singapore; ³Faculty of Mathematics and Information Science, Warsaw University of Technology, Koszykowa 75, 00-662, Warsaw, Poland.
- P513** **E-16475** **A Comparative Study of Differential Evolution Algorithms for Parameter Fitting Procedures 4662**
 Carlos E. Torres-Cerna¹, Alma Y. Alanis¹, Ignacio Poblete-Castro², Marta Bermejo-Jambrina³ and Esteban A. Hernandez-Vargas³
¹CUCEL, Universidad de Guadalajara, Blvd. Marcelino Garcia Barragan, Col. Olimpica, C.P. 44330, Zapopan, Jalisco, Mexico; ²Biosystems Engineering Laboratory, Center for Bioinformatic and Integrative Biology, Universidad Andrés Bello Republica 239, Santiago, Chile; ³Systems Medicine of Infectious Diseases, Helmholtz Centre for Infection Research, Inhoffenstr.7, 38124 Braunschweig, Germany.
- P514** **E-16558** **Contextual Bandit Algorithm for Risk-Aware Recommender Systems 4667**
 Djallel Bouneffouf
 Canada's Michael Smith Genome Sciences Centre, University of British Columbia, Vancouver, British Columbia, Canada.
- P515** **E-16537** **Multi-constraint Building Partitioning Formulation for Effective Contaminant Detection and Isolation 4675**
 Alexis Kyriacou¹, Stelios Timotheou¹, Michalis Michaelides², Christos Panayiotou¹ and Marios Polycarpou¹
¹Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus; ²Department of Electrical Engineering, Computer Engineering and Informatics, Cyprus University of Technology, Lemesos, Cyprus.
- P516** **E-16279** **Discovering Grid-Cell Models Through Evolutionary Computation 4683**
 Lin Wang¹, Bo Yang² and Jeff Orchard³
¹Shandong Provincial Key Laboratory of Network Based Intelligent Computing, University of Jinan, Jinan, 250022, China; ²Shandong Provincial Key Laboratory of Network Based Intelligent Computing, University of Jinan, Jinan, 250022, China; ³David R. Cheriton School of Computer Science, University of Waterloo, Waterloo, Canada.

- P517** **E-16670** **Cooperative Neuro-evolutionary Recurrent Neural Networks for Solar Power Prediction 4691**
Mashud Rana¹, Rohitash Chandra² and Vassilios G. Agelidis¹
¹*Australian Energy Research Institute, The University of New South Wales, Sydney, NSW, Australia;* ²*AI and Cybernetics Research Group, Software Foundation, Nausori, Fiji.*
- P518** **E-16844** **An Adaptive Clustering Routing Algorithm for Energy Harvesting-Wireless Sensor Networks 4699**
Xiangfei Zhang^{1,2}, Yongsheng Ding¹, Guangshun Yao^{1,3} and Kuangrong Hao¹
¹*Engineering Research Center of Digitized Textile & Fashion Technology, Ministry of Education College of Information Sciences and Technology, Donghua University, Shanghai 201620, P.R. China;* ²*Information Center, Shanghai Agricultural Committee, Shanghai 200335, P.R. China;* ³*College of Computer and Information Engineering, Chuzhou University, Chuzhou 239000, P.R. China*
- P519** **E-16915** **A Genetic Programming Approach to Modeling Power Losses of Insulate Gate Bipolar Transistors 4705**
Nicola Femia¹, Mario Migliaro¹ and Antonio Della Cioppa²
¹*Power Electronics and Renewable Sources Lab, DIEM University of Salerno, Via Giovanni Paolo II 132, 84084 Fisciano (SA), Italy;* ²*Natural Computation Lab, DIEM University of Salerno, Via Giovanni Paolo II 132, 84084 Fisciano (SA), Italy.*
- P520** **E-16369** **An Exploration of the Space of DNA Structural Properties Using an Evolutionary Algorithm 4713**
Wendy Ashlock
Ashlock Labs, Guelph, Ontario, N1G2R4, Canada.
- P521** **E-16783** **Functional Brain Network Extraction Using a Genetic Algorithm with a Kick-Out Method 4721**
Kei Harada¹, Misato Tanaka², Satoru Hiwa¹, Heiner Zille³, Sanaz Mostaghim³ and Tomoyuki Hiroyasu¹
¹*Faculty of Life and Medical Sciences, Doshisha University, Kyoto, Japan;* ²*Faculty of Science and Engineering, Doshisha University, Kyoto, Japan;* ³*Institute of Knowledge and Language Engineering, University of Magdeburg, Magdeburg, Germany.*
- P522** **E-16914** **A More Efficient Method for Domain Repeat Detection in WD-40 Proteins 4728**
Nuosi Wu¹, Jiarui Zhou^{2,3}, Zexuan Zhu¹ and Zhen Ji¹
¹*Shenzhen City Key Laboratory of Embedded System Design, College of Computer Science and Software Engineering, Shenzhen University, Shenzhen, 518060, China;* ²*School of Computer Science and Technology, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, 518055, China;* ³*School of Computer Science, University of Birmingham, Birmingham, B15 2TT, UK*

- P523** **E-16805** **Using Grouping Genetic Algorithm to Mine Diverse Group Stock Portfolio 4734**
Chun-Hao Chen¹, Cheng-Yu Lu¹, Tzung-Pei Hong^{2,3} and Ja-Hwung Su^{4,5}
¹Department of Computer Science and Information Engineering, Tamkang University, Taipei, Taiwan; ²Department of Computer Science and Information Engineering, National University of Kaohsiung, Kaohsiung, Taiwan; ³Department of Computer Science and Engineering, National Sun Yat-sen University, Taiwan; ⁴Department of Information Management, Cheng Shiu University, Kaohsiung, Taiwan; ⁵Department of Information Management, Kainan University, Taoyuan, Taiwan
- P524** **E-17060** **Learning Classifier System with Deep Autoencoder 4739**
Kazuma Matsumoto¹, Rei Saito¹, Yusuke Tajima¹, Masaya Nakata¹, Hiroyuki Sato¹, Tim Kovacs² and Keiki Takadama¹
¹The University of Electro-Communications, Tokyo, Japan; ²University of Bristol, Bristol, UK.
- P525** **E-17162** **XCS-DH: Minimal Default Hierarchies in XCS 4747**
Tim Kovacs¹, Simon Rawles, Larry Bull², Masaya Nakata³ and Keiki Takadama³
¹Department of Computer Science, University of Bristol, UK; ²Department of Computer Science and Creative Technologies, University of the West of England, UK; ³University of Electro-Communications, Japan.
- P526** **E-26039** **Applying Exponential Weighting Moving Average Control Parameter Adaptation Technique with Generalized Differential Evolution 4755**
Saku Kukkonen¹ and Carlos A. Coello Coello²
¹Centre of Computational Engineering and Integrated Design (CEID), Lappeenranta University of Technology, P.O. Box 20, FIN-53851 Lappeenranta, Finland; ²CINVESTAV-IPN, Computer Science Department, Av. IPN No. 2508, San Pedro Zacatenco, México D.F. 07300, México.
- P527** **E-16677** **An Evolutionary Many-Objective Optimisation Algorithm with Adaptive Region Decomposition 4763**
Hai-Lin Liu¹, Lei Chen¹, Qingfu Zhang² and Kalyanmoy Deb³
¹Guangdong University of Technology, Guangzhou, China; ²City University of Hong Kong, Hong Kong, China; ³Michigan State University, East Lansing, USA.
- P528** **E-16237** **Black-box Expensive Multiobjective Optimization with Adaptive In-fill rules 4770**
Qin Chen¹, Bingxiang Long² and Qingfu Zhang³
¹State Key Laboratory of Aerodynamics, China Aerodynamic R&D Center, Minayang, 86621000, China; ²Facility Design and Instrument Institute, China Aerodynamic R&D Center, Minayang, 86621000, China; ³School of Computer Science and Electrical Engineering, University of Essex, Essex, CO4 3SQ, United Kingdom.
- P529** **E-16905** **Performance Measures for Niching Algorithms 4775**
Jonathan Mwaura, Andries P. Engelbrecht and Filipe V. Nepocumeno
Department of Computer Science, University of Pretoria, Pretoria, South Africa.

- P530** **E-16323** **Differential Evolution with Auto-enhanced Population Diversity: the Experiments on the CEC'2016 Competition 4785**
Ming Yang¹, Jing Guan² and Changhe Li¹
¹*School of Computer Science, China University of Geosciences, Wuhan, 430074, China;* ²*China Ship Development and Design Center, Wuhan, 430064, China.*
- P531** **E-16554** **L-SHADE with Competing Strategies Applied to CEC2015 Learning-based Test Suite 4790**
Radka Poláková¹, Josef Tvrđík² and Petr Bujok²
¹*Centre of Excellence IT4Innovations, Institute for Research and Applications of Fuzzy Modeling, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic;* ²*Department of Computer Sciences, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic.*
- P532** **E-16583** **Success-History Based Adaptive Differential Evolution Algorithm with Multi-Chaotic Framework for Parent Selection Performance on CEC2014 Benchmark Set 4797**
Adam Viktorin, Michal Pluhacek and Roman Senkerik
Faculty of Applied Informatics, Tomas Bata University in Zlin, T. G. Masaryka 5555, 760 01 Zlin, Czech Republic.
- P533** **E-16586** **Correlation-based Genetic Algorithm for Real-parameter Optimization 4804**
Arghya Kundu¹, Sougata Laha² and Athanasios V. Vasilakos³
¹*Lexmark International Pvt. Ltd., Kolkata, India;* ²*School of Computer Engineering, Nanyang Technological University, Singapore;* ³*Department of Computer Science, Electrical and Space Engineering Lulea University of Technology, Sweden.*
- P534** **E-16539** **Cooperative Co-evolution using LSHADE with Restarts For The CEC15 Benchmarks 4810**
Mohammed El-Abd
Electrical and Computer Engineering Department, American University of Kuwait, Kuwait.

Session FM-12	Evolutionary Programming / Self-adaptation in Evolutionary Computation / SS CDCI-23: Computational Intelligence for Knowledge and Skills Transfer: Theories, Algorithms and Applications
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 202
Chair	Josu Ceberio / Min Jiang

- 2:30PM** **E-16800** **On the Relationship of Degree of Separability with Depth of Evolution in Decomposition for Cooperative Coevolution 4823**
Rohitash Chandra¹ Ratneel Deo^{1,2}, Kavitesh Bali² and Anurag Sharma²
¹*Artificial Intelligence and Cybernetics Research Group, Software Foundation, Nausori, Fiji;* ²*School of Computing Information and Mathematical Sciences, University of South Pacific, Suva, Fiji.*

- 2:50PM** **E-16177** **Speech Steganalysis using Evolutionary Restricted Boltzmann Machines** 4831
Catherine Paulin¹, Sid-Ahmed Selouani¹ and Éric Hervet²
¹Université de Moncton, Campus de Shippagan, LARIHS Laboratory, New Brunswick, Canada; ²Université de Moncton, Campus de Moncton, Département d'informatique, New Brunswick, Canada.
- 3:10PM** **E-17082** **Evolutionary Approach for Selection of Optimal EEG Electrode Positions and Features for Classification of Cognitive Tasks** 4846
Rimita Lahiri¹, Pratyusha Rakshit¹, Amit Konar¹ and Atulya K. Nagar²
¹Electronics & Telecommunication Engineering Department, Jadavpur University, Kolkata, India; ²Department of Mathematics and Computer Science, Liverpool Hope University, Liverpool, UK.
- 3:30PM** **E-16928** **Bayesian Optimization for Parameter Tuning in Evolutionary Algorithms** 4839
Ibai Roman¹, Josu Ceberio², Alexander Mendiburu¹ and Jose A. Lozano¹
¹Faculty of Computer Science, 20018 Donostia, Spain; ²School of Engineering, 48013 Bilbao, Spain and University of the Basque Country UPV/EHU, Spain.
- 3:50PM** **E-16138** **Chinese Character CAPTCHA Recognition Based on Convolution Neural Network** 4854
Yanping Lv^{1,2}, Feipeng Cai^{1,2}, Dazhen Lin^{1,2} and Donglin Cao^{1,2}
¹Cognitive Science Department, Xiamen University, Xiamen, 361005, China.
- 4:10PM** **E-16451** **A Spatial-Temporal Visual Mid-Level Ontology for GIF Sentiment Analysis** 4860
Zheng Cai^{1,2}, Donglin Cao^{1,2}, Dazhen Lin^{1,2} and Rongrong Ji^{1,2}
¹Cognitive Science Department, Xiamen University, Xiamen, 361005, China; ²Fujian Key Laboratory of the Brain-like Intelligent Systems, Xiamen, 361005, China

Session FM-13	SS CDCI-26: Cognitive Robotics
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 203
Chair	Chu Kiong Loo / Kosuke Sekiyama

- 2:30PM** **E-16570** **Estimation of Easily Visible Position for Unknown Object Grasping** 4866
Hiroyuki Masuta¹, Soichiro Nariki¹, Tatsuo Motoyoshi¹, Ken'ichi Koyanagia¹, Toru Oshima¹ and Hun-ok Lim²
¹Toyama Prefectural University, Department of Intelligent Systems Design Engineering, Imizu, Toyama, Japan; ²Kanagawa University, Department of Mechanical Engineering, Yokohama, Kanagawa, Japan

- 2:50PM** **E-16646** **Integrated Adaptive Resonance Theory Neural Model for Episodic Memory with Task Memory for Task Performance of Robots** 4873
 Ju-Youn Park, Yong-Ho Yoo, Deok-Hwa Kim and Jong-Hwan Kim
School of Electrical Engineering, KAIST, Daejeon 305--701, Republic of Korea.
- 3:10PM** **E-16648** **Subgraph Matching Route Navigation using by UAV and Ground Robot Cooperation** 4881
 Yifeng Cai and Kosuke Sekiyama
Graduated School fo Engineering, Nagoya University, Aichi, Japan.
- 3:30PM** **E-16714** **MotivEn: Motivational Engine with Sub-goal Identification for Autonomous Robots** 4887
 Rodrigo Salgado, Abraham Prieto, Pilar Caamaño, Francisco Bellas and Richard J. Duro
Integrated Group for Engineering Research, Universidade da Coruña, Spain.
- 3:50PM** **E-26037** **Walking Speed Control in Human Behavior Inspired Gait Generation System for Biped Robot** 4895
 Azhar Aulia Saputra, János Botzheim and Naoyuki Kubota
Graduate School of System Design, Tokyo Metropolitan University, 6-6 Asahigaoka, Hino, Tokyo 191-0065, Japan.

Session FM-14	Constraint and Uncertainty Handling / Dynamic and Uncertain Environments
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 204
Chair	Elizabeth Wanner / Bin Xin

- 2:30PM** **E-16273** **Constrained Evolutionary Wind Turbine Placement with Penalty Functions** 4903
 Daniel Lückehe¹, Markus Wagner² and Oliver Kramer³
¹*Department of Geoinformation, Jade University of Applied Sciences, Oldenburg, Germany;* ²*Optimisation and Logistics, University of Adelaide, Adelaide, Australia;* ³*Department of Computing Science, University of Oldenburg, Oldenburg, Germany.*
- 2:50PM** **E-16338** **A Quadratic Approximation-Based Local Search Operator for Handling Two Equality Constraints in Continuous Optimization Problems** 4911
 Carlos H. Fonseca¹ and Elizabeth Fialho Wanner²
¹*Post-graduate Program in Mathematical and Computational Modeling, CEFET-MG — Brasil;* ²*Department of Computer Engineering, CEFET-MG — Brasil.*

- 3:10PM E-16111 Robust Design Optimization Based on Multi-Objective Particle Swarm Optimization 4918**
Yu Yan, Dai Guangming, Chen Liang, Zhou Chong and Peng Lei
School of Computer Science, China University of Geosciences, Wuhan, China.
- 3:30PM E-16015 Solving the Uncertain Multi-objective Multi-stage Weapon Target Assignment Problem via MOEA/D-AWA 4934**
Juan Li, Jie Chen, Bin Xin, Lihua Dou and Zhihong Peng
School of Automation, Beijing Institute of Technology, Key Laboratory of Complex System Intelligent Control and Decision, Beijing, P.R. China.
- 3:50PM E-16879 Multi-Robot Box-Pushing in Presence of Measurement Noise 4926**
Pratyusha Rakshit¹, Amit Konar¹ and Atulya K. Nagar²
¹Electronics & Telecommunication Engineering Department, Jadavpur University, Kolkata, India; ²Department of Mathematics and Computer Science, Liverpool Hope University, Liverpool, UK.

Session FM-15	SS CDCI-03: Computational Intelligence Methods for Natural Language Processing
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 205
Chair	Keeley Crockett / Joao Paulo Carvalho

- 2:30PM E-16255 Fuzzy Ontologies in Semantic Similarity Measures 4942**
David Chandran¹ and Keeley Crockett²
¹Institute of Psychiatry, Psychology & Neuroscience, Kings College London, 16 De Crespigny Park, London, SE5 8AF, UK; ²Intelligent Systems Group, School of Computing, Mathematics and Digital Technology, Manchester Metropolitan University, Chester Street, Manchester, M1 5GD, UK.
- 2:50PM E-16292 A Hybrid Approach to Sentiment Analysis 4950**
Orestes Appel¹, Francisco Chielana¹, Jenny Carter¹ and Hamido Fujita²
¹Centre for Computational Intelligence (CCI), De Montfort University, Leicester, UK; ²Iwate Prefectural University (IPU), Takizawa, Iwate, Japan.
- 3:10PM E-16506 A Re-ranking Model for Accurate Knowledge Base Completion with Knowledge Base Schema and Web Statistic 4958**
Su Jeong Choi, Hyun-Je Song, Hee-Geun Yoon, Seong-Bae Park and Se-Young Park
School of Computer Science and Engineering, Kyungpook National University, Daegu 702-701, South Korea.
- 3:30PM E-16508 Automatic Generation of Exercises on Passive Transformation in Portuguese 4965**
Jorge Baptista¹, Sandra Lourenço² and Nuno J. Mamede²
¹INESC-ID Lisboa, Faculdade Ciências Humanas e Sociais, Universidade do Algarve, Portugal; ²INESC-ID Lisboa, Instituto Superior Técnico, Universidade de Lisboa, Portugal.

Session FM-16	SS CEC-42C: Special Session Associated with Competition on Bound Constrained Single Objective Numerical Optimization
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 206
Chair	Ponnuthurai Nagaratnam Suganthan / Ivan Zelinka

- 2:30PM E-16621 Competition On Learning-based Real-Parameter Single Objective Optimization by SOMA Swarm Based Algorithm with SOMARemove Strategy 4981**
Ivan Zelinka and Lukas Tomaszek
Department of Computer Science, FEI, VSB Technical University of Ostrava, Tr. 17. Listopadu 15, Ostrava, Czech Republic.
- 2:50PM E-16357 Analysis of the Bayesian Multi-Scale Optimistic Optimization on the CEC2016 and BBOB Testbeds 4988**
Abdullah Al-Dujaili and S. Suresh
School of Computer Engineering, Nanyang Technological University Singapore, 639798, Singapore.
- 3:10PM E-16386 Testing An Evolutionary Portfolio Algorithm on The CEC2016 Real-Parameter Single Objective Optimization 4996**
Junyan Yi¹, He Zheng² and Gang Yang²
¹Department of Computer Science and Technology, Beijing University of Civil Engineering and Architecture, Beijing, 100044, China; ²Multimedia Computing Lab, Department of Information, Renmin University of China, Beijing, China.
- 3:30PM E-16579 Evaluating the Performance of SHADE with Competing Strategies on CEC 2014 Single-Parameter Test Suite 5002**
Petr Bujok¹, Josef Tvrdík¹ and Radka Poláková²
¹Department of Computer Science, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic; ²Centre of Excellence IT4Innovations, Institute for Research and Applications of Fuzzy Modeling, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic.
- 3:50PM E-16541 An Asynchronous Adaptive Multi-population Model for Distributed Differential Evolution 5010**
Ivanoe De Falco¹, Umberto Scafuri¹, Ernesto Tarantino¹ and Antonio Della Cioppa²
¹Institute of High Performance Computing and Networking, National Research Council of Italy, Via P. Castellino, 111 80131 Naples, Italy; ²Natural Computation Lab, DIEM University of Salerno, Via Giovanni Paolo II 132, 84084 Fisciano (SA), Italy.

Session FM-17	Genetic Programming
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 207
Chair	Hitoshi Iba / Vic Ciesielski

- 2:30PM E-16513 Vanishing Ideal Genetic Programming 5018**
Hiroshi Kera and Hitoshi Iba
Department of Information and Communication Engineering, Graduate School of Information Science and Technology, The University of Tokyo Tokyo 113-8656, Japan.
- 2:50PM E-17098 Adapting to Concept Drift with Genetic Programming for Classifying Streaming Data 5026**
Murray Smith and Vic Ciesielski
RMIT University, Melbourne, Australia.
- 3:10PM E-16715 A Survey of Modularity in Genetic Programming 5034**
George Gerules and Cezary Janikow
Department of Math and Computer Science, University of Missouri — St. Louis, St. Louis, MO 63121.
- 3:30PM E-16866 Genetic Programming for Evolving Programs with Recursive Structures 5044**
Tessa Phillips, Mengjie Zhang and Bing Xue
School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.
- 3:50PM E-16591 More Efficient Evolution of Small Genetic Programs in Cartesian Genetic Programming by Using Genotypic Age 5052**
Roman Kalkreuth¹, Günter Rudolph¹ and Jörg Krone²
¹*TU Dortmund University, Department of Computer Science, 44221 Dortmund, Germany;* ²*South Westphalia University of Applied Science, 58644 Iserlohn, Germany.*
- 4:10PM E-17044 Exploring Position Independent Initialisation in Grammatical Evolution 5060**
David Fagan, Michael Fenton and Michael O'Neill
Natural Computing Research and Applications Group, School of Business University College Dublin, Dublin, Ireland.

Session FM-18	SS CDCI-15: Computational Intelligence Algorithms for Industrial and Design Engineering Problems
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 208+209
Chair	Mohamed Tawhid / Kang Li

2:30PM **E-16267** **A Comparison of Particle Swarm Optimization and Genetic Algorithms for a Multi-Objective Type-2 Fuzzy Logic Based System for the Optimal Allocation of Mobile Field Engineers 5068**

Andrew Starkey¹, Hani Hagrass¹, Sid Shakya² and Gilbert Owusu²
¹The Computational Intelligence Centre, School of Computer Science and Electronic Engineering, University of Essex, Colchester, UK; ²Business Modelling and Operational Transformation Practice, British Telecom, Adastral Park, Ipswich, UK

2:50PM **E-16247** **A Satellite Cluster Data Transmission Scheduling Method based on Genetic Algorithm with Rote Learning Operator 5076**

Hao Chen, Yirong Zhou, Chun Du and Jun Li
¹School of Electronic Science and Engineering, National University of Defense Technology, Changsha, China.

3:10PM **E-16803** **Battery Optimal Charging Strategy Based on A Coupled Thermoelectric Model 5084**

Kailong Liu, Kang Li, Zhile Yang, Cheng Zhang and Jing Deng
School of Electronics, Electrical Engineering and Computer Science, Queen's University Belfast, Belfast, BT9 5AH, United Kingdom.

Session FP-12	Engineering Applications
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 202
Chair	Markus Olhofer / Ali Sadollah

4:30PM **E-16252** **Hybrid Evolutionary Approach for Level Set Topology Optimization 5092**

Mariusz Bujny¹, Nikola Aulig², Markus Olhofer² and Fabian Duddeck¹
¹Technische Universität München, Arcisstraße 21, 80333 Munich, Germany;
²Honda Research Institute Europe GmbH, Carl-Legien-Straße 30, 63073 Offenbach/Main, Germany

- 4:50PM** **E-16833** **Application of Evolutionary Algorithms in Guaranteed Parameter Estimation 5100**
Thilo Goerke and Sebastian Engell
Process Operations and Dynamics Group, Technische Universität Dortmund, Dortmund, Germany.
- 5:10PM** **E-16393** **Approximate Solutions of Heat Transfer Fins with Convex and Exponential Profiles Using Fourier-Based Optimization Method 5106**
Ali Sadollah¹, Rong Su¹, Joong Hoon Kim² and Kaizhou Gao³
¹School of Electrical and Electronic Engineering, Nanyang Technological University, 639798, Singapore; ²School of Civil, Environmental and Architectural Engineering, Korea University, 136-713, Seoul, South Korea; ³School of computer, Liaocheng University, Liaocheng, 252059, P.R. China.
- 5:30PM** **E-17170** **NSGA-II for Joint Generation and Voyage Scheduling of an All-Electric Ship 5113**
Ce Shang^{1,2}, Dipti Srinivasan¹ and Thomas Reindl²
¹Department of Electrical and Computer Engineering, National University of Singapore, 117583, Singapore; ²Solar Energy Research Institute of Singapore, National University of Singapore, 117574, Singapore
- 5:50PM** **E-16356** **A Nonlinear Estimation and Control Algorithm based on Ant Colony Optimization 5120**
Hadi Nobahari and Saeed Nasrollahi
Department of Aerospace, Engineering, Sharif University, of Technology, Tehran, Iran.

Session FP-13	Heuristics, Metaheuristics and Hyper-heuristics
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 203
Chair	Xin Yao / Mohamed Bader-El-Den

- 4:30PM** **E-16185** **Improving the Performance of Evolutionary Engine Calibration Algorithms with Principal Component Analysis 5128**
Mohammad-H Tayarani-N¹, Adam Prügel Bennett², Hongming Xu³ and Xin Yao¹
¹CERCIA School of Computer, Science, University of Birmingham, Birmingham, UK; ²School of Electronics and Computer, Science, University of Southampton, Southampton, UK; ³School of Mechanical Engineering, University of Birmingham, Birmingham, UK.
- 4:50PM** **E-16212** **Cluster Analysis using a Gradient Evolution-based K-means Algorithm 5138**
R. J. Kuo and Ferani E. Zulvia
Department of Industrial Management, National Taiwan University of Science and Technology, Taipei, Taiwan.

- 5:10PM** **E-16239** **Optimizing D-GM Quantum Computing by Exploring Parallel and Distributed Quantum Simulations Under GPUs Architecture 5146**
Anderson Avila, Renata H. S. Reiser, Mauricio L. Pilla and Adenauer C. Yamin
Centre for Technological Development, Federal University of Pelotas, Pelotas, 1 Gomes Carneiro St, Brazil.
- 5:30PM** **E-16363** **Mathematical Function Optimization Using a Novel Algorithm Based on Newtonian Field Theory 5154**
Todd Perry and Mohamed Bader-El-Den
School of Computing, University of Portsmouth, Portsmouth PO1 3HE, UK.
- 5:50PM** **E-16615** **Towards Optimal Algorithmic Parameters for Simulation-Based Multi-Objective Optimization 5162**
Martin Andersson, Sunith Bandaru and Amos H. C. Ng
School of Engineering Science, University of Skövde, PO Box 408, 541 28 Skövde, Sweden.

Session FP-14	SS CDCI-29: Computational Intelligence in Marketing and Social Sciences
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 204
Chair	Raymond Chiong / Fernando Rubio

- 4:30PM** **E-16890** **Automatic Media Planning: Optimal Advertisement Placement Problems 5170**
Ismael Rodríguez, Fernando Rubio and Pablo Rabanal
Department Sistemas Informáticos y Computación. Facultad de Informática, Universidad Complutense de Madrid, 28040 Madrid, Spain.
- 4:50PM** **E-16936** **Incorporating Awareness and Genetic-based Viral Marketing Strategies to a Consumer Behavior Model 5178**
Juan Francisco Robles¹, Manuel Chica² and Óscar Cordon³
¹University of Granada, Granada, Spain; ²Computer Science Department, IN3, Open University of Catalonia, 08018, Barcelona, Catalonia, Spain; ³Department of Computer Science and Artificial Intelligence (DECSAI) and CITIC-UGR, University of Granada, Granada, Spain.
- 5:10PM** **E-17063** **Identifying Malicious Web Domains Using Machine Learning Techniques with Online Credibility and Performance Data 5186**
Zhongyi Hu¹, Raymond Chiong², Ilung Pranata², Willy Susilo³ and Yukun Bao⁴
¹School of Information Management, Wuhan University, Wuhan, 430072, China; ²School of Design, Communication & Information Technology The University of Newcastle, Callaghan, NSW 2308, Australia; ³School of Computing & Information Technology, The University of Wollongong, Wollongong, NSW 2252, Australia; ⁴School of Management, Huazhong University of Science and Technology, Wuhan, 430074, China.

5:30PM E-16644 A Novel Genetic Algorithm for Constructing Uniform Test Forms of Cognitive Diagnostic Models 5195
 Ye-shi Jiang^{2,3}, Ying Lin^{1,2}, Jing-Jing Li⁴, Zheng-jia Dai¹, Jun Zhang^{2,5,6} and Xinglin Zhang³
¹Department of Psychology, Sun Yat-sen University; ²School of Data & Computer Science, Sun Yat-sen University; ³Key Laboratory of Machine Intelligence & Sensor Networks, Ministry of Education, P.R. China; ⁴School of Computer Science, South China Normal University; ⁵School of Computer Science & Engineering, South China University of Technology; ⁶State Key Laboratory of Mathematical Engineering and Advanced Computing, China

Session FP-15	Large-scale Problems / SS CEC-19: Efficient Non-dominated Sorting and Pareto Approaches to Many-Objective Optimization
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 205
Chair	Asim Roy / Xingyi Zhang

4:30PM E-16124 Cooperative Coevolution with Dependency Identification Grouping for Large Scale Global Optimization 5201
 Guangming Dai¹, Xiaoyu Chen^{1,2}, Liang Chen¹, Maocai Wang^{1,3} and Lei Peng^{1,3}
¹School of Computer, China University of Geosciences, Wuhan, China; ²Group of Discrete and Combinatorial Optimization, University of Heidelberg, Heidelberg, Germany; ³Hubei Key Laboratory of Intelligent Geo-Information Processing, China University of Geosciences, Wuhan, China

4:50PM E-16058 A Phase Based Optimization Algorithm for Big Optimization Problems 5209
 Zijian Cao^{1,2}, Lei Wang¹, Xinhong Hei¹, Qiaoyong Jiang¹, Xiaofeng Lu¹ and Xiaofan Wang¹
¹School of Computer Science and Engineering, Xi'an University of Technology, Xi'an 710048, China; ²School of Computer Science and Engineering, Xi'an Technological University, Xi'an 710021, China

5:10PM E-17059 Two-layered Ensemble Kohonen Nets for Imbalanced Streaming Data 5215
 Asim Roy
Department of Information Systems, Arizona State University, Tempe, AZ 85287, USA.

5:30PM E-16308 A Multi-objective Evolutionary Algorithm Based on an Enhanced Inverted Generational Distance Metric 5222
 Ye Tian¹, Xingyi Zhang¹, Ran Cheng² and Yaochu Jin²
¹Institute of Bio-inspired Intelligence and Mining Knowledge, School of Computer Science and Technology, Anhui University, Hefei 230039, China; ²Department of Computer Science, University of Surrey, Guildford, Surrey, GU2 7XH, United Kingdom.

5:50PM **E-16142** **An Improved Reference Point Sampling Method on Pareto Optimal Front 5230**
 Cheng He¹, Linqiang Pan¹, Hang Xu², Ye Tian³ and Xingyi Zhang³
¹Laboratory of Image Information Processing and Intelligent Control, School of Automation, Huazhong University of Science and Technology, Wuhan, 430074, Hubei, China; ²Department of Computer Science, Xiamen University, Xiamen, 361005, Fujian, China; ³Key Lab of Intelligent Computing and Signal Processing of Ministry of Education, School of Computer Science and Technology, Anhui University, Hefei, 230039, Anhui, China.

Session FP-16	SS CEC-43: Evolutionary Physical Systems and Matter / SS CEC-16: Fitness Landscape Analysis in Practice
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 206
Chair	Stefano Nichele / Anna Rakitianskaia

4:30PM **E-16346** **A Simulation Tool for Evolving Functionalities in Disordered Nanoparticle Networks 5238**
 Ruud van Damme, Hajo Broersma, Julia Mikhal, Celestine Lawrence and Wilfred van der Wiel
 Faculty of Electrical Engineering, Mathematics and Computer Science, CTIT Institute for ICT Research and MESA+ Institute for Nanotechnology University of Twente, The Netherlands.

4:50PM **E-16335** **Towards Standalone In-Materio Devices: Stable Logic Gates and Elementary Cellular Automata in Carbon Nanotubes Material 5246**
 Sigve Sebastian Farstad, Stefano Nichele and Gunnar Tufte
 Norwegian University of Science and Technology, Trondheim, Norway.

5:10PM **E-16875** **Manipulating the Conductance of Single-Walled Carbon Nanotubes Based Thin Films for Evolving Threshold Logic Circuits Using Particle Swarm Optimisation 5255**
 F. Qaiser, A. Kotsialos, M. K. Massey, D. A. Zeze, C. Pearson and M. C. Petty
 School of Engineering and Computing Sciences, Durham University, Durham, United Kingdom.

5:30PM **E-16326** **The R-Package FLACCO for Exploratory Landscape Analysis with Applications to Multi-Objective Optimization Problems 5262**
 Pascal Kerschke and Heike Trautmann
 Information Systems and Statistics, University of Münster, 48149 Münster, Germany.

5:50PM **E-16685** **Analysis of Error Landscapes in Multi-layered Neural Networks for Classification 5270**
 Anna Rakitianskaia, Eduan Bekker, Katherine M. Malan and Andries Engelbrecht
Department of Computer Science, University of Pretoria, Pretoria, South Africa

Session FP-17	Genetic Programming
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 207
Chair	Marco Aurelio Pacheco / Chuan-Kang Ting

4:30PM **E-16657** **Directly Evolving Classifiers for Missing Data using Genetic Programming 5278**
 Cao Truong Tran, Mengjie Zhang and Peter Andreae
School of Engineering and Computer Science, Victoria University of Wellington, PO Box 600, Wellington 6140, New Zealand.

4:50PM **E-16629** **Genetic Programming and Automatic Differentiation Algorithms Applied to the Solution of Ordinary and Partial Differential Equations 5286**
 Waldir J. A. Lobão¹, Douglas Mota Dias² and Marco Aurélio C. Pacheco³
¹National School of Statistical Sciences, Brazilian Institute of Geography and Statistics — IBGE, Rio de Janeiro, 20231-050, Brazil; ²Department of Electronics and Telecommunications, Faculty of Engineering, Rio de Janeiro State University — UERJ, Rio de Janeiro, 20550-900, Brazil; ³Department of Electrical Engineering, Pontifical Catholic University of Rio de Janeiro — PUC-Rio, Rio de Janeiro, 22451-900, Brazil.

5:10PM **E-16874** **Learning Ensemble of Decision Trees through Multifactorial Genetic Programming 5293**
 Yu-Wei Wen and Chuan-Kang Ting
Department of Computer Science and Information Engineering and Advanced Institute of Manufacturing with High-tech Innovations, National Chung Cheng University, Chia-Yi 621, Taiwan.

Session FP-18	SS CDCI-01: Computational Intelligence for Industry 4.0
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 208+209
Chair	Yun Li / Cindy Goh

- 4:30PM** **E-16889** **Smart Design for Ships in a Smart Product Through-Life and Industry 4.0 Environment 5301**
 Joo Hock Ang¹, Cindy Goh² and Yun Li²
¹Sembcorp Marine Ltd, Singapore; and University of Glasgow, UK; ²School of Engineering, University of Glasgow, UK.
- 4:50PM** **E-17171** **Management Approaches for Industry 4.0 — A Human Resource Management Perspective 5309**
 Saqib Shamim¹, Shuang Cang², Hongnian Yu¹ and Yun Li³
¹Faculty of Sciences & Technology, Talbot Campus, Bournemouth University, UK; ²Faculty of Management, Talbot Campus, Bournemouth University, UK; ³School of Engineering, University of Glasgow, Glasgow G12 8LT, U.K
- 5:10PM** **E-17172** **Self-organizing Tool for Smart Design with Predictive Customer Needs and Wants to Realize Industry 4.0 5317**
 Alfredo Alan Flores Saldivar¹, Cindy Goh¹, Wei-neng Chen² and Yun Li³
¹School of Engineering, University of Glasgow, Glasgow G12 8LT, UK; ²School of Advanced Computing, Sun Yat-sen University, Guangzhou, China; ³School of Engineering, University of Glasgow, UK and College of Computer Science and Technology, Dongguan University of Technology, Dongguan, China.
- 5:30PM** **E-17144** **Intelligent Controller Design Coupled in a Communication Framework for a Networked HVAC System 5325**
 Narendra Kumar Dhar, Nishchal K. Verma and Laxmidhar Behera
Department of Electrical Engineering, IIT Kanpur, India