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*Chair: Carola Doerr, Nelishia Pillay*

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*Chair: Bilel Derbel, Amiram Moshaiov*

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*Chair: John Oyekan, Jinglei Guo*

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*Chair: Yan Pei, Tami Alghamdi*

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*Chair: Marco Nobile*

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*Chair: Saúl Zapotecas-Martínez*

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*Chair: Jonathan Fieldsend, Xiaofen Lu*

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*Chair: Oscar Cordon, Maisa Melo*

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*Chair: Yuhui Shi, Anirudh Suresh*

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*Chair: Bing Wang*

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*Chair: Liang Feng*

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*Chair: Jing Liang*

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*Chair: Amir Gandomi*

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*Chair: Tobias Benecke, Michal Przewozniczek*

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Department of Computational Intelligence; Wroclaw University of Science and Technology, Poland	
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University of Science and Technology of China, China; Harbin Institute of Technology, China; University of South China, China	
Tracking the Heritage of Genes in Evolutionary Algorithms	1800
Tobias Benecke and Sanaz Mostaghim	
Otto-von-Guericke University, Germany	
A Genetic Algorithm for Scheduling Splittable Tasks with Precedence Constraints	1808
Yuanliang Gao and Sheung-Hung Poon	
University of Nottingham, Ningbo China, China	
Loading is the Key: A Novel Genetic Quantum Algorithm for SDVRP	1817
Weijian Ma, Xinyuan Zhang, Yichen Xu and Fei Gao	
Beijing University of Posts and Telecommunications, China; Tsinghua University, China	
Genetic Algorithms for Error Mitigation in Quantum Measurement	1826
Giovanni Acampora, Michele Grossi and Autilia Vitiello	
University of Naples Federico II, Italy; IBM Italy, Italy	

## SPECIAL SESSION SS16-II: EVOLUTIONARY SCHEDULING AND COMBINATORIAL OPTIMISATION - II

*Chair: Yi Mei*

Quantum-Inspired Differential Evolution for Resource-Constrained Project-Scheduling: Preliminary Study	1833
Hatem M.H. Saad, Ripon K. Chakraborty and Saber Elsayed Capability Systems Centre, School of Engineering and IT, The University of New South Wales, Canberra, ACT, Australia, Australia; School of Engineering and IT, The University of New South Wales, Canberra, ACT, Australia, Australia	
Preferred Solutions of the Ground Station Scheduling Problem using NSGA-III with Weighted Reference Points Selection	1840
Margarita Antoniou, Gasper Petelin and Gregor Papa Jozef Stefan Institute, Jozef Stefan Intl. Postgraduate School, Slovenia	
Genetic Programming with Algebraic Simplification for Dynamic Job Shop Scheduling	1848
Sai Panda and Yi Mei Victoria University of Wellington, New Zealand	
A Dynamic Multiagent Genetic Algorithm for Optimal Charging in Wireless Rechargeable Sensor Networks	1856
Yating Cao, Jing Liu and Zhouwu Xu Xidian University, China	
Learning Initialisation Heuristic for Large Scale Vehicle Routing Problem with Genetic Programming	1864
Joao Guilherme Cavalcanti Costa, Yi Mei and Mengjie Zhang Victoria University of Wellington, New Zealand	
Look-Ahead Genetic Programming for Uncertain Capacitated Arc Routing Problem	1872
Jordan MacLachlan and Yi Mei Victoria University of Wellington, New Zealand	
Achieving Multi-Objective Scheduling of Heterogeneous Workflows inCloud through a Genetic Programming Based Approach	1880
Yongbo Yu, Hui Ma and Gang Chen Victoria University of Wellington Faculty of Science, New Zealand	

## SPECIAL SESSION SS21: EVOLUTIONARY MANY-OBJECTIVE OPTIMIZATION: METHODS AND APPLICATION

*Chair: Rui Wang*

An Adaptive Formulation-based Many-Objective Evolutionary Algorithm for Multi-Scenario Optimization in Data Enrichment	1888
Liang Fan, Xudong Feng and Handing Wang Xidian University, China; Science and Technology on Altitude Simulation Laboratory, AECC Sichuan Gas Turbine Establishment, China	
A Many-Objective Evolutionary Algorithm Based on New Angle Penalized Distance	1896
Fang Junchao and Fang Wei Jiangnan University, China	

Multi-objective Tabu-based Differential Evolution for Teleportation of Smart Virtual Machines in Private Computing Clouds	1904
Jerzy Balicki and Piotr Dryja	
Warsaw University of Technology, Poland; Gdansk University of Technology, Poland	
Periodical Generation Update using an Unbounded External Archive for Multi-Objective Optimization	1912
Longcan Chen, Lie Meng Pang, Hisao Ishibuchi and Ke Shang	
Southern University of Science and Technology, China	
Comparing Selection Hyper-Heuristics for Many-Objective Numerical Optimization	1921
Sandra Venske, Carolina Almeida and Myriam Delgado	
Federal University of Technology - Parana (Utfpr), Brazil; Midwestern Parana State University (Unicentro), Brazil	
A Visualisation Method for Pareto Front Approximations in Many Objective Optimisation	1929
Kai Wu and Panoutsos George	
University of Sheffield, United Kingdom	

#### SPECIAL SESSION SS61: NICHING METHODS FOR MULTIMODAL OPTIMIZATION

*Chair: Ali Ahrari*

A Reinforcement-Learning-Based Evolutionary Algorithm Using Solution Space Clustering For Multimodal Optimization Problems	1938
Hai Xia, Changhe Li, Sanyou Zeng, Qingshan Tan, Junchen Wang and Shengxiang Yang	
School of Automation, China University of Geosciences, Wuhan, 430074; Hubei Key Laboratory of Advanced Control and Intelligent Automation for Complex Systems, China; School of Mechanical Engineering and Electronic Information China University of Geosciences, Wuhan, 430074, China; School of Computer Science and Informatics, De Montfort University, Leicester, LE1 9BH, United Kingdom	
Helper Objective Assisted Evolutionary Algorithm for Multi-modal Optimization	1946
Xu Yang, Rui Wang and Li Wenhua	
College of System Engineering, National University of Defense Technology, Changsha, P.R. China, China	
A Knowledge Transfer-Based Evolutionary Algorithm for Multimodal Optimization	1953
Wenhao Du, Zhigang Ren, An Chen and Hanqing Liu	
Xi'an Jiaotong University, China	
A Survey of Nearest-Better Clustering in Swarm and Evolutionary Computation	1961
Wenjian Luo, Xin Lin, Jiajia Zhang and Mike Preuss	
Harbin Institute of Technology, Shenzhen, China; University of Science and Technology of China, China; Leiden University, Netherlands	
Attention-oriented Brain Storm Optimization for Multimodal Optimization Problems	1968
Jian Yang and Yuhui Shi	
Southern University of Science and Technology, China	
A Modified APSODEE for Large Scale Optimization	1976
Dongyang Li, Weian Guo, Lei Wang and Qidi Wu	
Tongji University, China	

SPECIAL SESSION SS32-II: REAL-WORLD AND INDUSTRY APPLICATIONS OF EVOLUTIONARY COMPUTATION  
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*Chair: Amir Gandomi*

Design of Cyclone Dust Separators: A Constrained Multiobjective Optimization Perspective	1983
Aljosa Vodopija, Beate Breiderhoff, Boris Naujoks and Bogdan Filipic Jozef Stefan Institute, Slovenia; Technische Hochschule Koln, Germany	
Advancing Genetic Programming via Information Theory	1991
Aleksandr V Grin and Amir H Gandomi Stevens Institute of Technology, United States of America; University of Technology Sydney, Australia	
An Evolutionary Framework for Real-Time Fraudulent Credit Detection	1999
Behshad Mohebbali, Gelareh Karbaschi, Amirhessam Tahmassebi, Anke Meyer-Baese and Amir H. Gandomi Florida State University, United States of America; Purdue University Northwest Hammond, United States of America; University of Technology Sydney, Australia	
A Hybrid BRKGA Approach for the Two Stage Capacitated Facility Location Problem	2007
Gabriel Souto, Igor Morais, Liss Faulhaber, Glaydston Ribeiro and Pedro Henrique Gonzalez Federal Center for Technological Education of Rio de Janeiro - CEFET/RJ, Brazil; Federal University of Rio de Janeiro, Brazil	
Automatically Extracting Features Using Genetic Programming for Low-Quality Fish Image Classification	2015
Zichu Yan, Ying Bi, Bing Xue and Mengjie Zhang Victoria University of Wellington, New Zealand	
Contrapuntal composition and autonomous style development of organum motets by using AntsOMG	2023
Chun-yien Chang and Ying-ping Chen National Yang Ming Chiao Tung University, Taiwan	

SESSION R22: CLASSIFICATION, CLUSTERING, AND DATA-MINING

*Chair: Benjamin Mario Sainz-Tinajero, Peng Wang*

Continuous Encoding for Community Detection in Attribute Networks with Preserving Node Information	2031
Wei Zheng, Xin Liu and Jianyong Sun School of Mathematics and Statistics, Xi'an Jiaotong University, China	
Evolutionary Clustering Algorithm Using Supervised Classifiers	2039
Benjamin Mario Sainz-Tinajero, Andres Eduardo Gutierrez-Rodriguez, Hector G. Ceballos and Francisco J. Cantu-Ortiz Tecnologico de Monterrey, School of Engineering and Science, Mexico	
Complexity-Based Lambda Layer for Time Series Prediction	2046
Kenneth Brezinski and Ken Ferens University of Manitoba, Canada	
A Grid-dominance based Multi-objective Algorithm for Feature Selection in Classification	2053
Peng Wang, Bing Xue, Jing Liang and Mengjie Zhang Victoria University of Wellington, New Zealand; Zhengzhou University, China	

Evolving Simple Solutions to the CIFAR-10 Benchmark using Tangled Program Graphs	2061
Robert Smith, Ryan Amaral and Malcolm Heywood Dalhousie University, Canada	
Hulling versus Clustering - Two Complementary Applications of Non-Negative Matrix Factorization	2069
Slawomir Wierzchoń and Mieczysław Kłopotek Institute of Computer Science, Polish Academy Of Sciences, Poland	

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*Chair: Alexander Dockhorn*

Behavioral Cloning in Atari Games Using a Combined Variational Autoencoder and Predictor Model	2077
Brian Chen, Siddhant Tandon, David Gorsich, Alex Gorodetsky and Shravan Veerapaneni University of Michigan, United States of America; U.S. Army DEVCOM, United States of America	
Portfolio Search and Optimization for General Strategy Game-Playing	2085
Dockhorn Alexander, Hurtado-Grueso Jorge, Jeurissen Dominik, Xu Linjie and Perez-Liebana Diego Queen Mary University of London, Great Britain	
Coevolution of AI and Level Generators for Super Mario Game	2093
Julius Flimmel, Jakub Gemrot and Vojtech Cerny Charles University, Czech Republic	

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*Chair: Yi Mei*

Investigating binary EAs for Passive In-Building Distributed Antenna Systems	2101
Siddhartha Shakya, Kin Poon, Khawla AlShanqiti, Anis Ouali and Andrei Sleptchenko EBTIC, Khalifa University, United Arab Emirates; Department of Engineering Systems & Management, Khalifa University, United Arab Emirates	
An Evolutionary Hyper-Heuristic Approach to the Large Scale Vehicle Routing Problem	2109
Joao Guilherme Cavalcanti Costa, Yi Mei and Mengjie Zhang Victoria University of Wellington, New Zealand	
Genetic Programming with Archive for Dynamic Flexible Job Shop Scheduling	2117
Meng Xu, Fangfang Zhang, Yi Mei and Mengjie Zhang Victoria University of Wellington, New Zealand	
On the Application of Epsilon-Lexicase Selection in the Generation of Dispatching Rules	2125
Lucija Planinic, Marko Durasevic and Domagoj Jakobovic University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia	
Cheapest Insertion and Disruption of Routes Operators for Solving Multi-Depot Electric Vehicle Location Routing Problem with Time Windows and Battery Swapping via GRASP and RVND	2133
Braulio Portela, Heder Bernardino, Luciana Goncalves and Stenio Soares Universidade Federal de Juiz de Fora, Brazil	

Budget and SLA Aware Dynamic Workflow Scheduling in Cloud Computing with Heterogeneous Resources	2141
Yifan Yang, Victoria Huang, Gang Chen, Hui Ma and Mengjie Zhang	
School of Engineering and Computer Science, Victoria University of Wellington, New Zealand; School of Computing & Mathematical Sciences, University of Waikato, New Zealand	

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*Chair: Ali Ahrari*

Large-scale Multiobjective Optimization via Problem Decomposition and Reformulation	2149
Lianghao Li, Cheng He, Ran Cheng and Linqiang Pan	
Huazhong University of Science and Technology, China; Southern University of Science and Technology, China	
An Improved Weighted Optimization-based Framework for Large-scale MOPs	2156
Junhao Zheng, Lingjie Li, Qiuzhen Lin and Zhong Ming	
Shenzhen University, China	
An improved MOEA/D framework with multi-operator strategies for multi-objective optimization problems with a large scale of variables	2164
Zijian Cao, Chen Liu, Zhenyu Wang and Haowen Jia	
Xian Technological University, China	
Prediction Guided Meta-Learning for Multi-Objective Reinforcement Learning	2171
Fei-Yu Liu and Chao Qian	
University of Science and Technology of China, China; Nanjing University, China	
Decision Space Scalability Analysis of Multi-Objective Particle Swarm Optimization Algorithms	2179
Amirali Madani, Beatrice Ombuki-Berman and Andries Engelbrecht	
Brock University, Canada; Stellenbosch University, South Africa	

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*Chair: Yanan Sun*

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Cleber Silva, Daniel Rosa, Pericles Miranda, Filipe Cordeiro, Tapas Si, Andre Nascimento, Rafael Ferreira Mello and Paulo Mattos Neto	
UFRPE, Brazil; Bankura Unnayani Institute of Engineering, India; UFPE, Brazil	
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Amund Tenstad and Pauline C Haddow	
The Norwegian University of Science and Technology, Norway	
An Efficient and Flexible Automatic Search Algorithm for Convolution Network Architectures	2203
Zhao Liang and Fang Wei	
Jiangnan University, China	

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Pubudu Sanjeevani, Brijesh Verma and Joseph Affum Central Queensland University, Australia; Transport Safety, Australian Road Research Board (ARRB), Australia	
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Marco Baiocchi, Carlos Coello Coello, Gabriele Di Bari and Valentina Poggioni University of Perugia, Italy; CINEVESTAV, Mexico	
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*Chair: Herbert H Tsang, Matthew Witten*

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Ryan McBride and Herbert H Tsang Trinity Western University, Canada	
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Shadab Ahmad, Rajarshi Pal and Avatharam Ganivada University of Hyderabad, India; Institute for Development and Research in Banking Technology, India	
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Patrick Echtenbruck, Michael Emmerich, Martina Echtenbruck and Boris Naujoks Cologne University of Applied Sciences, Germany; Leiden University, Netherlands	
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Matthew Witten and Owen Clancey NYU Langone Hospital-Long Island, United States of America	

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*Chair: Kyle Robert Harrison, John Sheppard*

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Jason Kuo and John Sheppard Johns Hopkins University, United States of America; Montana State University, United States of America	
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Mohammad Majid al-Rifaie University of Greenwich, United Kingdom	
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Michael O'Neill and Anthony Brabazon University College Dublin, Ireland	
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*Chair: Stephen Chen, Antonio Chaves*

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Stephen Chen, Shehnaz Islam, Antonio Bolufe Rohler, James Montgomery and Tim Hendtals York University, Canada; University of Prince Edward Island, Canada; University of Tasmania, Australia; Swinburne University of Technology, Australia	
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Sebastian Rodriguez-Zbinden, Elizabeth Montero, Carola Blazquez and Pablo Miranda Universidad Tecnica Federico Santa Maria, Chile; Universidad Andres Bello, Chile; Universidad Catolica del Norte, Chile	
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Otto Pires, Rafael de Santiago and Jerusa Marchi Universidade Federal de Santa Catarina, Brazil	
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Calvin Rodrigues da Costa and Maria Nascimento Universidade Federal de Sao Paulo, Brazil	
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*Chair: Inmaculada Medina-Bulo, Manuel Nunez*

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Paulo Roberto Farah, Thaina Mariani, Enrique Augusto Roza, Rogerio C. Silva and Silvia Regina Vergilio	
UFPR, Brazil	
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RISE Research Institutes of Sweden / Malardalen University, Sweden; Malardalen University, Sweden; RISE Research Institutes of Sweden, Sweden	
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Universidad Complutense de Madrid, Spain	
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ITMO University, Russia	

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*Chair: Ke Shang, Ian Showalter*

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Shanghai Key Laboratory of Multidimensional Information Processing, School of Computer Science and Technology, East China Normal University, China; Science and Technology on Complex System Control and Intelligent Agent Cooperation Laboratory, Beijing Electro-mechanical Engineering Institute, China	
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Carleton University, Canada; Queens University, Canada	

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Department of Computer Science & Engineering, IIIT Guwahati, Assam - 781015, India, India; Departamento de Computacion, CINVESTAV-IPN, Mexico City, D.F. 07360, Mexico, Mexico	
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*Chair: Divya Kulkarni,*

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*Chair: Qiang Yang, Tanja Alderliesten*

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Instituto Tecnologico de Tijuana, Mexico; Universidad de Granada, Spain	
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Centrum Wiskunde & Informatica, Netherlands; Leiden University Medical Center, Netherlands	
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