

Genetic and Evolutionary Computation Conference 2022

Draft Conference Program

Last updated: June 25, 2022



Boston, USA
July 9-13, 2022



Association for
Computing Machinery

Advancing Computing as a Science & Profession



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GECCO is sponsored by the Association for Computing Machinery Special Interest Group for Genetic and Evolutionary Computation (SIGEVO). SIG Services: 2 Penn Plaza, Suite 701, New York, NY, 10121, USA, 1-800-342-6626 (USA and Canada) or +212-626-0500 (global).

Welcome

Dear GECCO attendees,

Welcome to the 2022 Genetic and Evolutionary Computation Conference (GECCO). After two years of meeting online – very successfully, we need to say – we are delighted to bring you the first ever hybrid-format GECCO: nearly every event and presentation will be accessible by every attendee, no matter their physical location and time zone.

GECCO is the leading, peer-reviewed conference in the field of evolutionary computation, and the main conference of the Special Interest Group on Genetic and Evolutionary Computation (SIGEVO) of the Association for Computing Machinery (ACM). To identify the most important and technically sound papers, the conference implements a rigorous and selective review process, conducted by two chairs per track in coordination with the Editor-in-Chief. The technical program is divided into 13 tracks reflecting all aspects of our field, including the recently established Neuroevolution track.

This year, we received 427 regular paper submissions and accepted 158 of them as oral presentations (37% acceptance rate) and 152 are appearing in the Companion Proceedings as poster papers (alongside 32 submitted directly as posters). Besides the technical tracks, GECCO'22 offers 38 tutorials, 23 workshops that cover important topics in our field, and a range of events: the Humies Awards ceremony, 10 competitions, Women@GECCO, Evolutionary Computation in Practice, a five-day SIGEVO Summer School preceding the conference, the “Conversation with John Koza”, the job market, and much more. The highlights of the event are the keynotes given by three esteemed North American researchers: Cynthia Breazeal of MIT, USA and Erik Goodman of MSU, USA and Meinolf Sellmann of InsideOpt, USA.

We are thankful to all authors, tutorial speakers, as well as workshop and competition organizers who contributed to GECCO despite the ongoing pandemic conditions. We would also like to express our thanks to all organizers, in particular to all chairs: tracks, tutorials, workshops, publicity, competitions, late breaking abstracts, and hot-off-the-press. We also thank the organizers of the Humies, Women@GECCO, and summer school, as well as to the members of our program committee. We sincerely appreciate all these efforts and contributions.

Some members of the organization team deserve particular recognition: Aldeida Aleti, Publicity Chair; Ales Zamuda, Virtualisation Chair; Alma Rahat, Proceedings Chair; Erik Hemberg, Local Chair; Irene Moser, Electronic Media Chair; and Nelishia Pillay and Sara Tari, Student Affairs Charis. Every single one of them has been indispensable. We also thank Ahmed Kheiri for optimizing the schedule of this hybrid conference; Brenda Ramirez, Melanie Field, and Roxane Rose of Executive Events who helped us with registrations and the logistics of the event, as well as Franz Rothlauf, Emma Hart, Anne Auger and Peter Bosman from SIGEVO and the Business Committee for their valuable advice and guidance. Moreover, our gratitude goes to our generous business sponsors and institutional supporters: Autogenetics, the BEACON Centre, Google, and the Technology Innovation Institute.

Last but not least, we thank our fellow organisers and the venues for working with us to provide you with a safe and sustainable event. Among others: to increase safety, the staff wear masks, and we provide spare masks and hand sanitiser; and to increase sustainability, we no longer print the program, and we provide locally sourced products and locally sourced keynote speakers.

Enjoy the conference... and stay safe and healthy!

Markus Wagner, GECCO 2022 General Chair
School of Computer Science, The University of Adelaide

Jonathan Fieldsend, GECCO 2022 Editor-in-Chief
Department of Computer Science, University of Exeter

Sponsors and Supporters

We gratefully acknowledge and thank our sponsors:



Gold sponsor



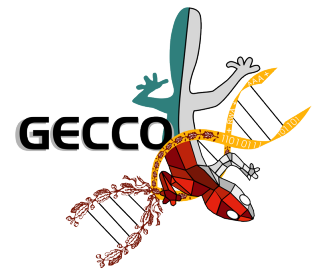
Silver sponsor



Bronze sponsor



Schedule



Schedule at a Glance.

Saturday, July 09	Sunday, July 10	Monday, July 11	Tuesday, July 12	Wednesday, July 13
Tutorials and Workshops (08:30–10:20)	Tutorials and Workshops (08:30–10:20)	Opening Session (08:30–08:50)	Poster Session II (Online) (08:30–10:00)	Paper Sessions, Hop, IMPACT and Funding-Related Session (09:00–10:20)
Break	Break	Invited Keynote Meinolf Sellmann (08:50–10:00)	Break	Break
Tutorials and Workshops (10:50–12:40)	Tutorials and Workshops (10:50–12:40)	Paper Sessions, and ECiP (10:30–11:50)	Invited Keynote Cynthia Breazeal (10:30–11:40)	SIGEVO Keynote Eric Goodman (10:50–12:00)
Lunch (12:40–13:40)	Lunch (12:40–13:40)	Lunch, and Job Market (11:50–12:50)	Lunch (11:40–12:40)	SIGEVO Meeting, Awards, and Closing (12:00–13:30)
Tutorials and Workshops (13:40–15:30)	Tutorials, Workshops, and Competitions (13:40–15:30)	Paper Sessions, Humies, HOP, and ECiP (12:50–14:10)	Paper Sessions (12:40–14:00)	
Break	Break	Break	Break	
Tutorials and Workshops (16:00–17:50)	Tutorials, Workshops, and Competitions (16:00–17:50)	Paper Sessions, and HOP (14:40–16:00)	Paper Sessions (14:30–15:50)	
Break	Break	Poster Session I (Hybrid) (16:00–18:00)	Break	
Women@GECCO (18:00–20:00)	Koza Reception (18:00–20:00)		Break	
			Social Event <i>Tuesday Night Banquet</i> (18:30–21:30)	

Workshop and Tutorial Sessions (July 09, 2022)

	08:30–10:20	10:50–12:40	13:40–15:30	16:00–17:50
Atlantic 1	Genetic improvement: Taking real-world source code and improving it using computational search methods (Haraldsson, Woodward, Brownlee, Winter, Alexander)	Graph-based Genetic Programming (Kalkreuth, Sotito, Vasicek)	Generative Hyper-heuristics (Tauritz, Woodward)	A (Biased) Introduction to Benchmarking (Auger)
Atlantic 2	Graybox Optimization and Next Generation Genetic Algorithms (Whitley)	Evolution of Neural Networks (Miikkulainen)	Benchmarking and analyzing iterative optimization heuristics with IOHprofiler (Doerr, Wang, Vermetten, Bäck, Nobel, Ye)	Automated Algorithm Configuration and Design (López-Ibáñez, of, Stützle, Cáceres)
Atlantic 3	Evolutionary Diversity Optimization for Combinatorial Optimization (Bossek, Neumann, Neumann)	Model-Based Evolutionary Algorithms (Thierens, Bosman)	Lexicase Selection (Helmuth, Cava, Medical) Sequential Experimentation by Evolutionary Algorithms (Shir, Bäck)	Quality-Diversity Optimization (Cully, Mouret, Doncieux)
Pacific A	Representations for Evolutionary Algorithms (Rothlauf)	Runtime Analysis of Population-based Evolutionary Algorithms (Lehre, Oliveto)	Bayesian Optimization (Cockuyt, Gonzalez, Branke)	Introductory Mathematical Programming for EC (Shir)
Pacific B-C	IAM: Industrial Applications of Metaheuristics	ECXAI: Evolutionary Computation and Explainable AI	ECXAI: Evolutionary Computation and Explainable AI	BENCH: Good Benchmarking Practices for Evolutionary Computation
Pacific G-H	EvoSoft: Evolutionary Computation Software Systems	GI: Genetic Improvement	GI: Genetic Improvement	GI: Genetic Improvement
Pacific F	BBOB: Black Box Optimization Benchmarking	BBOB: Black Box Optimization Benchmarking	EGML-EC: Enhancing Generative Machine Learning with Evolutionary Computation	SymReg: Symbolic Regression
Caspian	Student	Student		IWLCS: Learning Classifier Systems
Online 1	Difficulties in Fair Performance Comparison of Multiobjective Evolutionary Algorithms (Ishibuchi, Pang, Shang)	A Gentle Introduction to Theory (For Non-Theoreticians) (Doerr)	Transfer Learning in Evolutionary Spaces (Pillay)	Embedding Knowledge into Optimization Process (Gandomi)
Online 2	Evolutionary Continuous Dynamic Optimization (Yazdani, Yao)	Selection Hyper-heuristics (Kheiri, Keedwell)	Learning Classifier Systems: Cognitive Inspired Machine Learning for eXplainable AI (Siddique, Browne)	Evolutionary Computation for Feature Selection and Feature Construction (XUE, Zhang)



No Sessions



Advanced Tutorials



Introductory Tutorials



Workshops


Workshop and Tutorial Sessions (July 10, 2022)


	08:30–10:20	10:50–12:40	13:40–15:30	16:00–17:50
Atlantic 1		Introduction to Automated Design of Scheduling Heuristics with Genetic Programming (Durasevic, Jakobovic, Mei, of, Nguyen, Zhang)		
Atlantic 2		Evolutionary Submodular Optimisation (Neumann, Neumann, Qian)	Coevolutionary Computation for Adversarial Deep Learning (Toutouh, of, O'Reilly)	Evolutionary Computation and Machine Learning in Security (Picek, Jakobovic)
Atlantic 3	Statistical Analyses for Multi-objective Stochastic Optimization Algorithms (Eftimov, Korošec)	Benchmarking Multiobjective Optimizers 2.0 (Brockhoff, IP, Tušar)	Constraint-Handling Techniques used with Evolutionary Algorithms (Coello)	Evolutionary Computation and Evolutionary Deep Learning for Image Analysis, Signal Processing and Pattern Recognition (Zhang, Cagnoni)
Pacific A	Optimization Challenges at the European Space Agency (Izzo, López-Ibáñez)	EQUm: Evolutionary Optimization in Uncertainty Quantification Models	Competition	Competition
Pacific B-C		QD-Benchmarks: Quality Diversity Algorithm Benchmarks	QD-Benchmarks: Quality Diversity Algorithm Benchmarks	SAEOpt: Surrogate-Assisted Evolutionary Optimisation
Pacific G-H	QuantOpt: Quantum Optimization	QuantOpt: Quantum Optimization	QuantOpt: Quantum Optimization	SecDef: Genetic and Evolutionary Computation in Defense, Security, and Risk Management
Pacific F	AABOH: Analysing algorithmic behaviour of optimisation heuristics	AABOH: Analysing algorithmic behaviour of optimisation heuristics		
Caspian	ECDM: Evolutionary Computation and Decision Making	ECDM: Evolutionary Computation and Decision Making	ECADA: Evolutionary Computation for the Automated Design of Algorithms	EvoRL: Evolutionary Reinforcement Learning
Online 1	Theory and Practice of Population Diversity in Evolutionary Computation (Sudholt, Squillero)		NEWK: Neuroevolution at work	LEOL: Large-Scale Evolutionary Optimization and Learning
Online 2	CMA-ES and Advanced Adaptation Mechanisms (Akimoto, Hansen)		Ant Colony Optimisation for Software Engineers (Gavidia-Calderon, Menendez)	Decomposition Multi-Objective Optimisation Current Developments and Future Opportunities (Li, Zhang)

 No Sessions
  Specialized Tutorials
  Competition
  Advanced Tutorials
  Introductory Tutorials
  Workshops

Parallel Sessions (Monday, July 11 – Wednesday, July 13)

	Monday July 11 10:30–11:50	Monday July 11 12:50–14:10	Monday July 11 14:40–16:00	Tuesday July 12 12:40–14:00	Tuesday July 12 14:30–15:50	Tuesday July 12 16:20–17:40	Wednesday July 13 09:00–10:20
Atlantic 1	GECH 1★	GP 2★	CS 1★	SBSE 1 - NE 3★	EMO 4★	SBSE 2	NE 4
Atlantic 2	ENUM 1 - Theory 1★	EML 1★	GA 1★	RWA 4	RWA 5★	ECOM 5★	RWA 6
Atlantic 3	NE 1	NE 2	EML 2	EML 3	EML 4	ACO-SI 2	EML 5
Pacific A	EMO 1	RWA 1	RWA 3	GECH 2	GECH 3	GECH 4	EMO 5
Pacific B-C	GP 1	HOP 1	HOP 2	No Sessions	ENUM 2	HOP 3	HOP 4
Pacific G-H	ECiP 1	ECiP 2	EMO 2	EMO 3	CS 2	CS 3	CS + IMPACT
Pacific F	ECOM 1	Humies	ECOM 2	ECOM 3	ECOM 4	GA 2	GA 3
Caspian	ACO-SI 1	RWA 2	GP 3	GP 4	Theory 2	Theory 3	Funding-related session by Aldeida Aleti

 No Sessions

 Humies	 HOP	 ECiP	 Specialized Session
 Sessions with Best Paper Nominees	 Standard Paper Sessions		

Track List and Abbreviations

ACO-SI Ant Colony Optimization and Swarm Intelligence

CS Complex Systems (Artificial Life/Artificial Immune Systems/Generative and Developmental Systems/Evolutionary Robotics/Evolvable Hardware)

ECOM Evolutionary Combinatorial Optimization and Metaheuristics

EML Evolutionary Machine Learning

EMO Evolutionary Multiobjective Optimization

ENUM Evolutionary Numerical Optimization

GA Genetic Algorithms

GECH General Evolutionary Computation and Hybrids

GP Genetic Programming

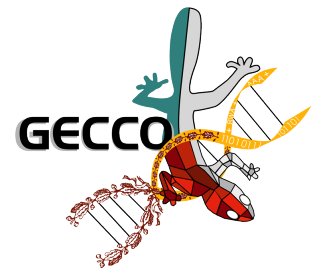
NE Neuroevolution

RWA Real World Applications

SBSE Search-Based Software Engineering

Theory Theory

Keynotes





GECCO KEYNOTE

Modern Hybrids

Monday, July 11, 08:50-10:00

Meinolf Sellmann, *InsideOpt*

This talk summarizes our 15+ years of work on the use of Machine Learning for Search & Optimization. I review the four main approaches that we invented during this time. Since learning during search takes effort, it should not surprise that we designed three of these approaches for a particular target range of total function evaluations: from few tens of dozens, to thousands, to many hundreds of thousands of function evaluations. The last hybrid I review regards a surrogate-based approach for optimization under stochastic uncertainty. The wonder of this research area is that each of these four methods defines the state of the art in its respective area, giving significant empirical evidence that learning to optimize can be highly effective.

Biosketch: Meinolf currently serves as CTO of InsideOpt, a US-based startup that produces general-purpose software for automating decision-making under uncertainty. Before, he held positions as Director for Network Optimization at Shopify, Lab Director for the Machine Learning and the Knowledge Representation Labs at General Electric's Global Research Center, Senior Manager for Cognitive Computing at IBM Research, and Assistant Professor for Computer Science at Brown University. Meinolf received his doctorate degree in 2002 from Paderborn University (Germany) and then went on to Cornell University as Postdoctoral Associate. Meinolf has published over 80 articles in international conferences and journals, holds six patents, served as PC Chair of IAAI 2021 and 2022, LION 2016, and CPAIOR 2013, Conference Chair of CP 2007, and Associate Editor of the *Journal on Computing*. He won over 22 first prizes at international programming competitions, most recently two first prizes at the AI4TSP competition held at IJCAI 2021.



GECCO KEYNOTE

Emotion, Social Robots, and a New Human-Robot Relationship

Tuesday, July 12, 10:30-11:40

Cynthia Breazeal, *Massachusetts Institute of Technology*

People have welcomed conversational AI technologies into our homes, workplaces, and institutions where we interact with them on a daily basis. The proliferation of digital assistants in a multitude of embodiments (e.g., speakers, displays, avatars, robots) in human environments over extended periods of time provides us with new ways to investigate, develop and assess the design of personified AIs that emotionally engage and support people to promote human flourishing across a wide range of applications and usage contexts. In this talk, I highlight a number of research projects where we are developing, fielding, and assessing social robots in homes, schools, and living communities of older adults. We explore

different embodiments and develop adaptive algorithmic capabilities for our robots to sustain interpersonal engagement and personalize to people's needs to support novel interventions in education, social engagement, and emotional wellness. In addition to evaluating the impact of these capabilities and features on improving learning, sustaining engagement, nudging behavior, and shifting attitudes — we are also examining the nature of the relationship that people form with these personified AI technologies and how it contributes to these impacts. We conclude by reflecting on the ethical and responsible design of intelligent technologies that emotionally engage and build relationships with people.

Biosketch: Cynthia Breazeal is a Professor at the MIT Media Lab where she founded and directs the Personal Robots Group. She is also MIT dean for digital learning leading professional education, and director of MIT's initiative on Responsible AI for Social Empowerment and Education (RAISE) to help bring AI education to K12 and the workforce. She is a pioneer in the field of social robotics and human-robot interaction. Her research focuses on the design and real-world impact of personalized and emotionally engaging personified AI technologies that promote personal growth, learning, creativity and flourishing by people of all ages. She is author of the seminal book 'Designing Sociable Robots,' named a AAAI Fellow, and is a recipient of the George R. Stibitz Computer & Communications Pioneer Award. She has spoken at prestigious venues such as TED, CES, SXSW, the World Economic Forum, and the United Nations on topics related to AI, innovation, and society. She is globally recognized as an award-winning innovator, designer, and entrepreneur. Her work has been recognized by the National Academy of Engineering, the National Design Awards, and Technology Review's TR100/35 Award. She was founder, Chief Scientist and Chief Experience Officer of the mass consumer home robotics startup, Jibo, Inc. whose eponymous robot received numerous design and innovation awards by CES, Fast Company, Core 77, and was featured on the cover of TIME magazine as part of the 2017 Best Inventions Awards. She received her doctorate from MIT in Electrical Engineering and Computer Science in 2000.



GECCO KEYNOTE

An Evolutionary Optimizer's Path to Commercial Success and Some Rocket Science Beyond It

Wednesday, July 13, 10:50-12:00

Erik Goodman, *Michigan State University and BEACON Center for the Study of Evolution in Action, USA*

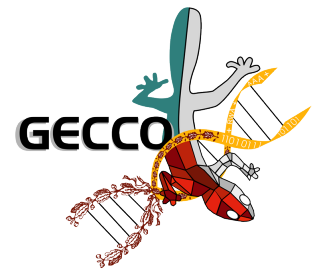


Few EC technologies have gone from universities to commercial success. Goodman will describe the SHERPA algorithm, part of the HEEDS design exploration framework, and how Red Cedar Technology, which he co-founded, eventually succeeded. Beginning 20 years ago, SHERPA used a self-adapting ensemble of EC methods (GA, ES, DE, SA, etc.) in each run, requiring no choice of optimization methods or parameters by the engineering user. It is a best-selling engineering design optimizer, still built around the original code developed in 1999-2010, although current owner Siemens now has 20+ developers on HEEDS and SHERPA. Goodman will then turn to a problem outside SHERPA's scope, addressed with unpublished parallel EC methods. NASA provided a futuristic challenge

problem to teams of DARPA awardees, to develop ways to optimize the distribution of a set of solid propellant types (eventually to be 3D-printed) in a rocket. Goodman will describe the modeling of the rocket and several problem-specific EC methods used to find feasible solutions to this problem with a design space of 10^{300} - 10^{500} and over 700 constraints.

Biosketch: Erik D. Goodman is PI and Executive Director of the BEACON Center for the Study of Evolution in Action, an NSF Science and Technology Center headquartered at Michigan State University, funded by NSF for 2010-20, and now continuing with funding from MSU. BEACON has a dynamic research program and extensive education and outreach programs, and includes evolutionary biologists as well as computer scientists/engineers studying evolutionary computation (for search and optimization) and evolution of digital organisms. Goodman is a professor in Electrical and Computer Engineering, Mechanical Engineering, and Computer Science and Engineering. He was co-founder and VP Technology, Red Cedar Technology, Inc., (now a division of Siemens), which developed design optimization software that has become a best-selling system in industry. He was named Michigan Distinguished Professor of the Year, 2009, and received the MSU Distinguished Faculty Award in 2011. He was elected Chair of the Executive Board (2003-2005) and Senior Fellow, International Society for Genetic and Evolutionary Computation; then was Founding Chair of the ACM SIG on Genetic and Evolutionary Computation (SIGEVO), 2005. His current personal research is on evolutionary algorithms for optimization of heterogeneous propellant grains for solid-fuel rockets and on evolutionary approaches to neural architecture search.

Tutorials



Introductory Tutorials

Graybox Optimization and Next Generation Genetic Algorithms Darrell Whitley, <i>Colorado State University</i>	Saturday, July 09, 08:30–10:20 Atlantic 2
Evolutionary Diversity Optimization for Combinatorial Optimization Jakob Bossek, <i>RWTH Aachen University</i> Aneta Neumann, <i>The University of Adelaide</i> Frank Neumann, <i>The University of Adelaide</i>	Saturday, July 09, 08:30–10:20 Atlantic 3
Representations for Evolutionary Algorithms Franz Rothlauf, <i>Universität Mainz</i>	Saturday, July 09, 08:30–10:20 Pacific A
Difficulties in Fair Performance Comparison of Multiobjective Evolutionary Algorithms Hisao Ishibuchi, <i>Southern University of Science and Technology</i> Lie Meng Pang, <i>Southern University of Science and Technology</i> Ke Shang, <i>Southern University of Science and Technology</i>	Saturday, July 09, 08:30–10:20 Online 1
Evolutionary Continuous Dynamic Optimization Danial Yazdani, <i>Southern University of Science and Technology</i> Xin Yao, <i>Southern University of Science and Technology</i>	Saturday, July 09, 08:30–10:20 Online 2
Graph-based Genetic Programming Roman Kalkreuth, <i>TU Dortmund</i> Leo Sotto, <i>Fraunhofer Institute for Algorithms and Scientific Computing</i> Zdenek Vasicek, <i>Brno University of Technology</i> ,	Saturday, July 09, 10:50–12:40 Atlantic 1
Evolution of Neural Networks Risto Miikkulainen, <i>The University of Texas at Austin and Cognizant AI Labs</i>	Saturday, July 09, 10:50–12:40 Atlantic 2
Model-Based Evolutionary Algorithms Dirk Thierens, <i>Utrecht University</i> Peter Bosman, <i>Centrum Wiskunde & Informatica (CWI)</i>	Saturday, July 09, 10:50–12:40 Atlantic 3
A Gentle Introduction to Theory (For Non-Theoreticians) Benjamin Doerr, <i>Ecole Polytechnique and Laboratoire d'Informatique (LIX)</i>	Saturday, July 09, 10:50–12:40 Online 1
Selection Hyper-heuristics Ahmed Kheiri, <i>Lancaster University</i> Edward Keedwell, <i>University of Exeter</i>	Saturday, July 09, 10:50–12:40 Online 2
Generative Hyper-heuristics Daniel Tauritz, <i>Auburn University</i> John Woodward, <i>Queen Mary University of London</i>	Saturday, July 09, 13:40–15:30 Atlantic 1
Bayesian Optimization Ivo Couckuyt, <i>Ghent University</i> Sebastian Rojas Gonzalez, <i>Ghent University</i> Juergen Branke, <i>University of Warwick</i>	Saturday, July 09, 13:40–15:30 Pacific A

Transfer Learning in Evolutionary Spaces Nelishia Pillay, <i>University of Pretoria</i>	Saturday, July 09, 13:40–15:30 Online 1
Learning Classifier Systems: Cognitive Inspired Machine Learning for eXplainable AI Abubakar Siddique, <i>Victoria University of Wellington</i> Will Browne, <i>Queensland University of Technology</i>	Saturday, July 09, 13:40–15:30 Online 2
A (Biased) Introduction to Benchmarking Anne Auger, <i>Inria</i>	Saturday, July 09, 16:00–17:50 Atlantic 1
Automated Algorithm Configuration and Design Manuel López-Ibáñez, <i>University of Málaga and University of Manchester</i> Thomas Stützle, <i>Université Libre de Bruxelles</i> Leslie Pérez Cáceres, <i>Pontificia Universidad Católica de Valparaíso</i>	Saturday, July 09, 16:00–17:50 Atlantic 2
Quality-Diversity Optimization Antoine Cully, <i>Imperial College</i> Jean-Baptiste Mouret, <i>Inria Nancy - Grand Est and CNRS, Université de Lorraine</i> Stéphane Doncieux, <i>ISIR, Sorbonne University and CNRS</i>	Saturday, July 09, 16:00–17:50 Atlantic 3
Introductory Mathematical Programming for EC Ofar Shir, <i>Tel-Hai College and The Galilee Research Institute - Migal</i>	Saturday, July 09, 16:00–17:50 Pacific A
Embedding Knowledge into Optimization Process Amir H. Gandomi, <i>University of Technology Sydney</i>	Saturday, July 09, 16:00–17:50 Online 1
Evolutionary Computation for Feature Selection and Feature Construction Bing XUE, <i>Victoria University of Wellington</i> Mengjie Zhang, <i>Victoria University of Wellington</i>	Saturday, July 09, 16:00–17:50 Online 2

Advanced Tutorials

Genetic improvement: Taking real-world source code and improving it using computational search methods Saemundur Haraldsson, <i>University of Stirling and University of Stirling</i> John Woodward, <i>Queen Mary University of London</i> Alexander Brownlee, <i>Stirling University</i> Emily Winter, <i>Lancaster University</i> Brad Alexander, <i>The University of Adelaide</i>	Saturday, July 09, 08:30–10:20 Atlantic 1
Runtime Analysis of Population-based Evolutionary Algorithms Per Lehre, <i>University of Birmingham and The Alan Turing Institute</i> Pietro Oliveto, <i>University of Sheffield</i>	Saturday, July 09, 10:50–12:40 Pacific A

<p>Benchmarking and analyzing iterative optimization heuristics with IOHprofiler Carola Doerr, <i>Sorbonne University and CNRS, LIP6</i> Hao Wang, <i>Leiden University</i> Diederick Vermetten, <i>Leiden University</i> Thomas Bäck, <i>Leiden University</i> Jacob de Nobel, <i>Leiden University</i> Furong Ye, <i>Leiden University</i></p>	<p>Saturday, July 09, 13:40–15:30 Atlantic 2</p>
<p>Lexicase Selection Thomas Helmuth, <i>Hamilton College</i> William La Cava, <i>Boston Children's Hospital and Harvard Medical School</i></p>	<p>Saturday, July 09, 13:40–14:35 Atlantic 3</p>
<p>Sequential Experimentation by Evolutionary Algorithms Ofer Shir, <i>Tel-Hai College and The Galilee Research Institute - Migal</i> Thomas Bäck, <i>Leiden University</i></p>	<p>Saturday, July 09, 14:35–15:30 Atlantic 3</p>
<p>Statistical Analyses for Multi-objective Stochastic Optimization Algorithms Tome Eftimov, <i>Jožef Stefan Institute</i> Peter Korošec, <i>Jožef Stefan Institute</i></p>	<p>Sunday, July 10, 08:30–10:20 Atlantic 3</p>
<p>Theory and Practice of Population Diversity in Evolutionary Computation Dirk Sudholt, <i>University of Passau</i> Giovanni Squillero, <i>Politecnico di Torino</i></p>	<p>Sunday, July 10, 08:30–10:20 Online 1</p>
<p>CMA-ES and Advanced Adaptation Mechanisms Youhei Akimoto, <i>University of Tsukuba and RIKEN AIP</i> Nikolaus Hansen, <i>Inria and Ecole Polytechnique</i></p>	<p>Sunday, July 10, 08:30–10:20 Online 2</p>
<p>Evolutionary Submodular Optimisation Aneta Neumann, <i>The University of Adelaide</i> Frank Neumann, <i>The University of Adelaide</i> Chao Qian, <i>Nanjing University</i></p>	<p>Sunday, July 10, 10:50–12:40 Atlantic 2</p>
<p>Benchmarking Multiobjective Optimizers 2.0 Dimo Brockhoff, <i>Inria and IP Paris</i> Tea Tušar, <i>Jozef Stefan Institute</i></p>	<p>Sunday, July 10, 10:50–12:40 Atlantic 3</p>
<p>Coevolutionary Computation for Adversarial Deep Learning Jamal Toutouh, <i>Massachusetts Institute of Technology and University of Málaga</i> Una-May O'Reilly, <i>Massachusetts Institute of Technology</i></p>	<p>Sunday, July 10, 13:40–15:30 Atlantic 2</p>
<p>Constraint-Handling Techniques used with Evolutionary Algorithms Carlos Coello Coello, <i>CINVESTAV-IPN</i></p>	<p>Sunday, July 10, 13:40–15:30 Atlantic 3</p>

Specialized Tutorials

Optimization Challenges at the European Space Agency

Dario Izzo, *European Space Agency*

Manuel López-Ibáñez, *University of Málaga and University of Manchester*

Sunday, July 10, 08:30–10:20
Pacific A

Introduction to Automated Design of Scheduling Heuristics with Genetic Programming

Marko Durasevic, *University of Zagreb Faculty of electrical engineering and computing*

Domagoj Jakobovic, *University of Zagreb, Faculty of Electrical Engineering and Computing*

Yi Mei, *School of Engineering and Computer Science, Victoria University of Wellington*

Su Nguyen, *Research Centre for Data Analytics and Cognition, La Trobe University*

Mengjie Zhang, *School of Engineering and Computer Science, Victoria University of Wellington*

Sunday, July 10, 10:50–12:40
Atlantic 1

Ant Colony Optimisation for Software Engineers

Carlos Gavidia-Calderon, *The Open University*

Hector Menendez, *Kings College London*

Sunday, July 10, 13:40–15:30
Online 2

Evolutionary Computation and Machine Learning in Security

Stjepan Picek, *Radboud University and Delft University of Technology*

Domagoj Jakobovic, *University of Zagreb*

Sunday, July 10, 16:00–17:50
Atlantic 2

Evolutionary Computation and Evolutionary Deep Learning for Image Analysis, Signal Processing and Pattern Recognition

Mengjie Zhang, *Victoria University of Wellington*

Stefano Cagnoni, *University of Parma*

Sunday, July 10, 16:00–17:50
Atlantic 3

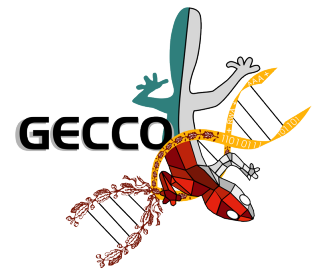
Decomposition Multi-Objective Optimisation Current Developments and Future Opportunities

Ke Li, *University of Exeter*

Qingfu Zhang, *City University of Hong Kong*

Sunday, July 10, 16:00–17:50
Online 2

**Workshops,
Late-breaking Abstracts,
and Women@GECCO**



AABOH – Analysing algorithmic behaviour of optimisation heuristics

Organizers: Anna V Kononova, LIACS, Leiden University, The Netherlands; Hao Wang, LIACS, Leiden University, The Netherlands; Michael Emmerich, LIACS, Leiden University, The Netherlands; Peter A. N. Bosman, Centre for Mathematics and Computer Science, The Netherlands; Daniela Zaharie, West University of Timisoara, Romania; Fabio Caraffini, Institute of Artificial Intelligence, De Montfort University, Leicester, UK; Johann Dreo, Pasteur Institute and CNRS, France

Room: Pacific F

Session 1: Contributed Paper

Time: Sunday, July 10, 08:30–10:20

Welcome Talk	08:30
Survivor Selection in a Crossoverless Evolutionary Algorithm Nielis Brouwer , Danny Dijkzeul , Levi Koppenhol , Iris Pijning , Daan van den Berg	08:35
Exactly characterizable parameter settings in a crossoverless evolutionary algorithm Levi Koppenhol , Nielis Brouwer , Danny Dijkzeul , Iris Pijning , Joeri Slegers , Daan van den Berg	08:50
Examining Algorithm Behavior using Recurrence Quantification and Landscape Analyses Mario Munoz Acosta	09:05
The Effect of Decoding Fairness on Particle Swarm Optimization for the p-Median Problem Pavel Kromer , Vojtech Uher	09:20
Dynamic Computational Resource Allocation for CFD Simulations Based on Pareto Front Optimization Gašper Petelin , Margarita Antoniou , Gregor Papa	09:35
Using Structural Bias to Analyse the Behaviour of Modular CMA-ES Diederick Vermetten , Fabio Caraffini , Bas van Stein , Anna Kononova	09:50
Closing	10:05

Session 2: Theoretical and Empirical Analysis of Optimisation Heuristics

Time: Sunday, July 10, 10:50–12:40

Opening Talk	10:50
Invited Talk Benjamin Doerr, École Polytechnique, Palaiseau, France	10:55
Invited Talk Thomas Bartz-Beielstein, TH Koeln, Institute for Data Science, Engineering, and Analytics, Germany	11:40
Panel Discussion	12:25
Closing Remarks	12:35

BBOB – Black Box Optimization Benchmarking

Organizers: Anne Auger, Inria and CMAP, Ecole Polytechnique, IP Paris, France; Dimo Brockhoff, Inria and CMAP, Ecole Polytechnique, IP Paris, France; Konstantin Dietrich, TH Köln, Germany; Paul Dufossé, Inria and Thales Defense Mission Systems, France; Tobias Glasmachers, Ruhr-Universität Bochum, Germany; Nikolaus Hansen, Inria and CMAP, Ecole Polytechnique, IP Paris, France; Olaf Mersmann, TU Köln, Germany; Petr Pošík, Czech Technical University, Czech Republic; Tea Tušar, Jožef Stefan Institute, Slovenia

Room: Pacific F

Session 1: A Benchmarking Jam Session

Time: Saturday, July 09, 08:30–10:20

The BBOBies: "Mini-Introduction to COCO"	08:30
Benchmarking the Hooke-Jeeves Method, MTS-LS1, and BSrr on the Large-scale BBOB Function Set Ryoji Tanabe	08:35
Benchmarking an algorithm for expensive high-dimensional objectives on the bbob and bbob-largescale testbeds Zachary Hoffman , Steve Huntsman	08:55
Benchmarking some variants of the CMAES-APOP using Keeping Search Points and Mirrored Sampling combined with Active CMA on the BBOB Noiseless Testbed Duc Manh Nguyen	09:15
Benchmarking of Two Implementations of CMA-ES with Diagonal Decoding on the bbob Test Suite Mohamed Gharafi	09:35
Benchmarking CMA-ES with Margin on the bbob-mixint Testbed Ryoki Hamano , Shota Saito , Masahiro Nomura , Shinichi Shirakawa	09:55
The BBOBies: "Session remarks"	10:15

Session 2: Constrained Optimization

Time: Saturday, July 09, 10:50–12:40

The BBOBies: "The bbob-constrained Test Suite and Constrained Performance Assessment in COCO"	10:50
Benchmarking [U+FFFD] [U+FFFD] MAg-ES and BP-[U+FFFD] [U+FFFD] MAg-ES on the bbob-constrained Testbed Michael Hellwig , Hans-Georg Beyer	11:05
Benchmarking several strategies to update the penalty parameters in AL-CMA-ES on the bbob-constrained testbed Paul Dufossé , Asma Atamna	11:25
Constrained blackbox optimization with the NOMAD solver on the COCO constrained test suite Charles Audet , Sébastien Le Digabel , Ludovic Salomon , Christophe Tribes	11:45
Open Discussion	12:05

BENCH – Good Benchmarking Practices for Evolutionary Computation

Organizers: Carola Doerr, CNRS and Sorbonne University, France; Tome Eftimov, Stefan Institute, Slovenia; Pascal Kerschke, TU Dresden, Germany; Boris Naujoks, TH Cologne, Germany; Mike Preuss, Leiden University, The Netherlands; Vanessa Volz, modl.ai, Denmark

Time: Saturday, July 09, 16:00–17:50, Pacific B-C

Welcome & Opening	16:00
Invited Talk: Performance Evaluation in the Real World: Challenges and Potential Solutions Risto Miikkulainen	16:10
Invited Talk: Performance Evaluation in the Real World: Challenges and Potential Solutions Tea Tušar	16:55
Discussion: relevance, approaches, and practicability of benchmarking for industry	17:40

ECADA – Evolutionary Computation for the Automated Design of Algorithms

Organizers: Daniel R. Tauritz, Auburn University, USA; John Woodward, Queen Mary University of London, UK; Manuel López-Ibáñez, University of Malaga, Spain

Time: Sunday, July 10, 13:40–15:30, Caspian

Opening Talk Daniel Tauritz, John Woodward, Manuel López-Ibáñez	13:40
Why Functional Program Synthesis Matters (In the Realm of Genetic Programming) Fraser Garrow, Michael Lones, Robert Stewart	13:50
Reinforcement learning based adaptive metaheuristics Michele Tessari, Giovanni Iacca	14:15
Invited Talk: Transfer Learning in Automated Design Using Generation Hyper-Heuristics Nelishia Pillay	14:40
Closing Remarks Daniel Tauritz, John Woodward, Manuel López-Ibáñez	15:25

ECDM – Evolutionary Computation and Decision Making

Organizers: Tinkle Chugh, University of Exeter, UK; Richard Allmendinger, University of Manchester, UK; Jussi Hakanen, Silo AI, Finland

Room: Caspian

Session 1

Time: Sunday, July 10, 08:30–10:20

Opening Talk	08:30
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Desirable Properties of Performance Indicators for Assessing Interactive Evolutionary Multiobjective Optimization Methods	08:40
Pouya Aghaei Pour , Sunith Bandaru , Bekir Afsar , Kaisa Miettinen	
R-MBO: A Multi-surrogate Approach for Preference Incorporation in Multi-objective Bayesian Optimisation	09:05
Tinkle Chugh	
Invited Talk: Evolutionary Computation and Decision Making in Unsupervised Learning	09:30
Julia Handl	
Closing Remarks	10:15

Session 2**Time:** Sunday, July 10, 10:50–12:40

Opening Talk	10:50
Interactive MOEA/D with Multiple Types of Preference Information	10:55
Giomara Larraga Maldonado , Kaisa Miettinen	
Preliminary Results of Advanced Heuristic Optimization in the Risk-based Energy Scheduling Competition	11:20
Jose Almeida , Fernando Lezama , Joao Soares , Zita Vale , Bruno Canizes	
Interactive Evolutionary Multiobjective Optimization with Modular Physical User Interface	11:45
Atanu Mazumdar , Stefan Otayagich , Kaisa Miettinen	
Closing Remarks	12:10

ECXAI – Evolutionary Computation and Explainable AI

Organizers: Jaume Bacardit, Newcastle University, UK; Alexander E.I. Brownlee, University of Stirling, UK; Giovanni Iacca, University of Trento, Italy; John McCall, Robert Gordon University, UK; Stefano Cagnoni, University of Parma, Italy; David Walker, University of Plymouth, UK

Room: Pacific B-C**Session 1:** Introduction, invited talk & ECXAI papers**Time:** Saturday, July 09, 10:50–12:40

The intersection of Evolutionary Computation and Explainable AI	10:50
Jaume Bacardit , Alexander Brownlee , Stefano Cagnoni , Giovanni Iacca , John McCall , David Walker	
Invited Talk: Performance Evaluation in the Real World: Challenges and Potential Solutions	11:10
Will N. Browne	
Towards Explainable Metaheuristic: Mining Surrogate Fitness Models for Importance of Variables	11:50
Manjinder Singh , Alexander Brownlee , David Cairns	
An Explainable Visualisation of the Evolutionary Search Process	12:10
Mathew Walter , David Walker , Matthew Craven	

Open Discussion 12:30

Session 2: ECXAI papers & discussion

Time: Saturday, July 09, 13:40–15:30

Towards the Evolutionary Assessment of Neural Transformers Trained on Source Code 13:40
Martina Saletta , Claudio Ferretti

Interpretable AI for policy-making in pandemics 14:00
Leonardo Custode , Giovanni Iacca

Evolving Explainable Rule Sets 14:20
Hormoz Shahrzad , Babak Hodjat , Risto Miikkulainen

Improving the Search of Learning Classifier Systems Through Interpretable Feature Clustering 14:40
Hayden Andersen , Andrew Lensen , Will Browne

Open Discussion 15:00

EGML-EC – Enhancing Generative Machine Learning with Evolutionary Computation

Organizers: Jamal Toutouh, University of Malaga, Spain - MIT, USA; Una-May O'Reilly, MIT, USA; João Correia, University of Coimbra, Portugal; Penousal Machado, University of Coimbra, Portugal; Sergio Nesmachnow, Universidad de la República, Uruguay

Time: Saturday, July 09, 13:40–15:30, Pacific F

Opening Talk 13:40
Jamal Toutouh, João Correia

COIL: Constrained Optimization in Learned Latent Space: Learning Representations for Valid Solutions 13:45
Peter Bentley , Soo Ling Lim , Adam Gaier , Linh Tran

Evolving SimGANs to Improve Abnormal Electrocardiogram Classification 14:07
Gabriel Wang , Anish Thite , Rodd Talebi , Anthony D'Achille , Alex Mussa , Jason Zutty

Exploring Expression-based Generative Adversarial Networks 14:29
Francisco Baeta , João Correia , Tiago Martins , Penousal Machado

Multi-target evolutionary latent space search of a generative adversarial network for human face generation 14:51
Benjamín Machín , Sergio Nesmachnow , Jamal Toutouh

Open Discussion 15:13

Closing Remarks 15:25
Jamal Toutouh, João Correia

EQUUM – Evolutionary Optimization in Uncertainty Quantification Models

Organizers: Josu Ceberio, University of the Basque Country (UPV/EHU), Spain; Rafael Villanueva, Universitat Politècnica de València (UPV), Spain; Ignacio Hidalgo, Universidad Complutense de Madrid, Spain; Francisco Fernandez, de Vega Universidad de Extremadura, Spain

Time: Sunday, July 10, 10:50–12:40, Pacific A

Openning Talk	10:50
Josu Ceberio, Rafael Villanueva, Ignacio Hidalgo, Francisco Fernandez de Vega	
Approaching Epistemic and Aleatoric uncertainty with Evolutionary Optimization: Examples and Challenges	11:00
Josu Ceberio , Juan Cortés , Francisco Fernández de Vega , Óscar Garnica , José Hidalgo , José Velasco , Rafael Villanueva	
Evolutionary Approach to Model Calibration with Uncertainty: An Application to Breast Cancer Growth Model	11:20
Carlos Andreu-Villarraig , Josu Cebeiro , Juan-Carlos Cortés , Francisco Fernández de Vega , José-Ignacio Hidalgo , Rafael-Jacinto Villanueva	
Probability Density Function Computation in Evolutionary Model Calibration with Uncertainty	11:40
Vicente Bevia	
Closing Remarks	12:00
Josu Ceberio, Rafael Villanueva, Ignacio Hidalgo, Francisco Fernandez de Vega	

EvoRL – Evolutionary Reinforcement Learning

Organizers: Giuseppe Paolo, Huawei Technologies France; Adam Gaier, Autodesk AI Lab; Antoine Cully, Imperial College London, UK; Alexandre Coninx, Sorbonne University, France

Time: Sunday, July 10, 16:00–17:50, Caspian

Welcome and introduction	16:00
Accelerating Genetic Algorithm Evolution Via Ant-Based Mutation and Crossover for Application to Large-scale TSPs	16:03
Darren Chitty	
Lexicase Selection at Scale	16:21
Li Ding , Ryan Boldi , Thomas Helmuth , Lee Spector	
High-performance Cartesian Genetic Programming on GPU for the Inference of Gene Regulatory Networks using scRNA-Seq Time-Series Data	16:39
Luciana Prachedes , José Eduardo da Silva , Heder Bernardino , Itamar de Oliveira	
Invited Talk	16:57
Julian Togelius, Associate Professor Department of Computer Science and Engineering Tandon School of Engineering New York University	

EvoSoft – Evolutionary Computation Software Systems

Organizers: Stefan Wagner, University of Applied Sciences Upper Austria; Michael Affenzeller, University of Applied Sciences Upper Austria

Time: Saturday, July 09, 08:30–10:20, Pacific G-H

Welcome & Opening Talk	08:30
JGEA: a Modular Java Framework for Experimenting with Evolutionary Computation Eric Medvet , Giorgia Nadizar , Luca Manzoni	08:35
Recent developments in HNCO Arnaud Berny	08:55
Facilitating the Hybridization of Parallel Evolutionary Algorithms in Cluster Computing Environments Hatem Khallouf , Sergen Ciftci , Shadi Shahoud , Clemens Döpmeier , Kevin Förderer , Veit Hagenmeyer	09:15
DynStack - A Benchmarking Framework for Dynamic Optimization Problems in Warehouse Operations Andreas Beham , Sebastian Leitner , Johannes Karder , Bernhard Werth , Stefan Wagner	09:35
Workshop Closing	09:55

GI – Genetic Improvement

Organizers: Bobby R. Bruce, UC Davis, USA; Vesna Nowack, Fixie Project, Lancaster University, UK; Aymeric Blot, CREST, UCL, UK; Emily Winter, Fixie Project, Lancaster University, UK; Bill Langdon, CREST, UCL, UK; Justyna Petke, CREST, UCL, UK

Room: Pacific G-H

Session 1

Time: Saturday, July 09, 10:50–12:40

Welcome Talk Bobby R. Bruce	10:50
Invited Talk Westley Weimer, University of Michigan	10:55
Amaru - A Framework for combining Genetic Improvement with Pattern Mining Oliver Krauss	12:00
Genetic Improvement in the Shackleton Framework for Optimizing LLVM Pass Sequences Shuyue Stella Li , Hannah Peeler , Andrew Sloss , Kenneth Reid , Wolfgang Banzhaf	12:25

Session 2

Time: Saturday, July 09, 13:40–15:30

Evaluation of Genetic Improvement Tools for Improvement of Non-functional Properties of Software Shengjie Zuo , Aymeric Blot , Justyna Petke	13:40
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Opportunities for Genetic Improvement of Cryptographic Code	14:05
Chitchanok Chuengsatiansup , Markus Wagner , Yuval Yarom	
Towards evolution-based autonomy in large-scale systems	14:20
Damien Anderson , Paul Harvey , Yusaku Kaneta , Petros Papadopoulos , Philip Rodgers , Marc Roper	
Genetic Improvement of Shoreline Evolution Forecasting Models	14:35
Mahmoud Al Najar , Rafael Almar , Erwin Bergsma , Jean-Marc Delvit , Dennis Wilson	
The case for Grammatical Evolution in test generation	15:00
Aidan Murphy , Thomas Laurent , Anthony Ventresque	
Leveraging Fuzzy System to Reduce Uncertainty of Decision Making in Software Engineering Automation	15:15
Yueke Zhang , Yu Huang	
Session 3	
Time: Saturday, July 09, 16:00–17:50	
Dissecting Copy/Delete/Replace/Swap mutations: Insights from a GIN Case Study	16:00
Sherlock Licorish , Markus Wagner	
Py2Cy: A Genetic Improvement Tool To Speed Up Python	16:25
James Zhong , Max Hort , Federica Sarro	
Automatically Exploring Computer System Design Spaces	16:40
Bobby Bruce	
Industry+Student+Faculty Event	16:55
Prizes and Closing Remarks	17:35

IAM – Industrial Applications of Metaheuristics

Organizers: Silvino Fernandez Alzueta, ArcelorMittal Global R
D; Pablo Valledor Pellicer, ArcelorMittal Global R
D; Thomas Stützle, Université Libre de Bruxelles

Time: Saturday, July 09, 08:30–10:20, Pacific B-C

Welcome and Introduction	08:30
Invited Talk: Industrial applications of AI in ArcelorMittal: a true global approach	08:35
Carlos Alba, Chief Digital Officer of ArcelorMittal Global Research & Development	
One-Shot Optimization for Vehicle Dynamics Control Systems: Towards Benchmarking and Exploratory Landscape Analysis	09:20
André Thomaser , Anna Kononova , Marc-Eric Vogt , Thomas Bäck	
Multi-depot periodic vehicle routing with variable visit patterns	09:40
Vinicius Gandra , Carlo S. Sartori , Hatice Çalik , Pieter Smet	
Algorithmically-Guided Postharvest Protocols by Experimental Combinatorial Optimization	10:00
Ofar Shir , Boris Yazmir , Assaf Israeli , Dan Gamrasni	

IWLCS – Learning Classifier Systems

Organizers: David Pätzel, University of Augsburg, Germany; Alexander Wagner, University of Hohenheim, Germany; Michael Heider, University of Augsburg, Germany

Time: Saturday, July 09, 16:00–17:50, Caspian

Welcome Note	16:00
Pätzel, Wagner, Heider	
An Overview of LCS Research from 2021 to 2022	16:05
Michael Heider , David Pätzel , Alexander Wagner	
Preliminary Tests of an Anticipatory Classifier System with Experience Replay	16:25
Olgierd Unold , Norbert Kozłowski , Łukasz Śmierzchała	
XCSF under Limited Supervision	16:45
Markus Görlich-Bucher , Jörg Hähner	
XCS on Embedded Systems: An Analysis of Execution Profiles and Accelerated Classifier Deletion	17:05
Mathis Brede , Tim Hansmeier , Marco Platzner	
Invited Talk: An LCS for Critical Software Test Selection in Continuous Integration	17:25
Lukas Rosenbauer	
Open Discussion, and Closing Remarks	17:45
Pätzel, Wagner, Heider	

LEOL – Large-Scale Evolutionary Optimization and Learning

Organizers: Nabi Omidvar, University of Leeds, UK; Yuan Sun, University of Melbourne, Australia; Xiaodong Li, RMIT University, Australia

Time: Sunday, July 10, 16:00–17:50, Online 1

Welcome and Introduction	16:00
Invited Talk: Evolutionary Learning for Combinatorial Optimisation	16:05
Su Nguyen, La Trobe University, Australia	
Accelerating Genetic Algorithm Evolution Via Ant-Based Mutation and Crossover for Application to Large-scale TSPs	16:50
Darren Chitty	
Lexicase Selection at Scale	17:10
Li Ding , Ryan Boldi , Thomas Helmuth , Lee Spector	
High-performance Cartesian Genetic Programming on GPU for the Inference of Gene Regulatory Networks using scRNA-Seq Time-Series Data	17:30
Luciana Prachedes , José Eduardo da Silva , Heder Bernardino , Itamar de Oliveira	

NEWK – Neuroevolution at work

Organizers: Ivanoe De Falco, ICAR-CNR, Italy; Antonio Della Cioppa, University of Salerno, Italy; Umberto Scafuri, ICAR-CNR, Italy; Ernesto Tarantino, ICAR-CNR, Italy

Time: Sunday, July 10, 13:40–15:30, Online 1

Opening Talk	13:40
Ivanoe De Falco, Antonio Della Cioppa, Ernesto Tarantino	
Evolution of Activation Functions for Deep Learning-Based Image Classification	13:45
Raz Lapid , Moshe Sipper	
On the Impact of Body Material Properties on Neuroevolution for Embodied Agents: the Case of Voxel-based Soft Robots	14:10
Eric Medvet , Giorgia Nadizar , Federico Pigozzi	
Heed the Noise in Performance Evaluations in Neural Architecture Search	14:35
Arkadiy Dushatskiy , Tanja Alderliesten , Peter Bosman	
Open Discussion	15:00
Closing Remarks	15:35
Ivanoe De Falco, Antonio Della Cioppa, Ernesto Tarantino	

QD-Benchmarks – Quality Diversity Algorithm Benchmarks

Organizers: John Rieffel, Union College, USA; Antoine Cully, Imperial College London, UK; Jean-Baptiste Mouret, Inria Nancy - Grand Est, CNRS, Université de Lorraine, France; Stéphane Doncieux, Université Pierre et Marie Curie-Paris, France; Stefanos Nikolaidis, University of Southern California, USA; Julian Togelius, New York University, USA; Matthew C. Fontaine, University of Southern California, USA; Amy K Hoover, New Jersey Institute of Technology, USA

Room: Pacific B-C

Session 1

Time: Sunday, July 10, 10:50–12:40

Welcoming/Opening Remarks	10:50
Towards QD-suite: developing a set of benchmarks for Quality-Diversity algorithms.	11:00
Salehi, Doncieux	
Hypervolume-based Benchmark Functions for Quality Diversity Algorithms.	11:15
Mouret	
Jaggy Snake: A Quality Diversity Optimization Benchmark for Action Sequences and Conditional Dependencies.	11:30
Fontaine, Soros, Togelius, Hoover, Nikolaidis	
QD Benchmark: planar arm.	11:45
Cully, Gaier, Mouret	
Benchmarking Quality-Diversity Algorithms on Neuroevolution for Reinforcement Learning.	12:00
Flageat, Lim, Grillotti, Allard, Smith, Cully	

Assessing Quality-Diversity NeuroEvolution Algorithms Performance in Hard Exploration Problems.	12:15
Chalumeau, Pierrot, Macé, Flajolet, Beguir, Cully, Perrin-Gilbert	
Open/Panel Discussion	12:30
Session 2	
Time: Sunday, July 10, 13:40–15:30	
Welcome Talk	13:40
A Collection of Quality Diversity Optimization Problems Derived from Hyperparameter Optimization of Machine Learning Models	13:45
Lennart Schneider , Florian Pfisterer , Janek Thomas , Bernd Bischl	
Multimodal optimisation tasks to assess Quality-Diversity optimisation performance.	14:00
Hoover, Preuss	
Quantifying Efficiency in Quality Diversity Optimization.	14:15
Tjanaka,Fontaine, Nikolaidis	
A discretization-free metric for assessing Quality Diversity algorithms	14:30
Paul Kent , Juergen Branke , Jean-Baptiste Mouret , Adam Gaier	
Open/Panel Discussion	14:45
Wrap-up	15:25

QuantOpt – Quantum Optimization

Organizers: Alberto Moraglio, University of Exeter, UK; Serban Georgescu, Fujitsu Research of Europe, UK; Francisco Chicano, University of Malaga, Spain; Darrell Whitley, Colorado State University, USA; Oleksandr Kyriienko, University of Exeter, UK; Denny Dahl, ColdQuanta, USA; Ofer Shir, Tel-Hai College and Migal Institute, Israel; Lee Spector, Amherst College, Hampshire College, and the University of Massachusetts, Amherst, USA

Room: Pacific G-H

Session 1

Time: Sunday, July 10, 08:30–10:20

Welcome and Introduction	08:30
Invited talk: Stochastic Search Acceleration for Global Optimization: Digital Annealer and Future Technologies	08:33
Ali Sheikholeslami	
Quantum Parametric Circuit Optimization with Estimation of Distribution Algorithms	09:08
Vicente P. Soloviev , Pedro Larrañaga , Concha Bielza	
Evolutionary Quantum Architecture Search for Parametrized Quantum Circuits	09:26
Li Ding , Lee Spector	

The Applicability of Reinforcement Learning for the Automatic Generation of State Preparation Circuits	09:44
Thomas Gabor , Maximilian Zorn , Claudia Linnhoff-Popien	
A Novel Quantum-inspired Evolutionary Computation-based Quantum Circuit Synthesis for Various Universal Gate Libraries	10:02
Yao-Hsin Chou , Shu-Yu Kuo , Yu-Chi Jiang , Ching-Hsuan Wu , Jyun-Yi Shen , Cheng-Yen Hua , Pei-Shin Huang , Yun-Ting Lai , Yong Feng Tong , Ming-He Chang	
Session 2	
Time: Sunday, July 10, 10:50–12:40	
AutoQubo: Data-driven automatic QUBO generation	10:50
Alberto Moraglio , Serban Georgescu , Przemysław Sadowski	
Algorithmic QUBO Formulations for k-SAT and Hamiltonian Cycles	11:08
Jonas Nüßlein , Thomas Gabor , Claudia Linnhoff-Popien , Sebastian Feld	
Techniques to Enhance a QUBO Solver For Permutation-Based Combinatorial Optimization	11:26
Siong Thye Goh , Jianyuan Bo , Sabrish Gopalakrishnan , Hoong Chuin Lau	
Enhancing a QUBO solver via Data Driven Multi-start and its Application to Vehicle Routing Problem	11:44
Whei Yeap Suen , Matthieu Parizy , Hoong Chuin Lau	
Probabilistic reasoning as Quadratic Unconstrained Binary Optimization	12:02
Marco Baiocchi	
Hybrid Quantum-Classical Heuristic for the Bin Packing Problem	12:20
Mikel Garcia de Andoin , Eneko Osaba , Izaskun Oregi , Esther Villar Rodríguez , Mikel Sanz	
Session 3	
Time: Sunday, July 10, 13:40–15:30	
Invited talk 2: Instant Insanity via Quantum Computing	13:40
Denny Dahl	
Modifying the Quantum-Assisted Genetic Algorithm	14:15
Thomas Gabor , Michael Lachner , Nico Kraus , Christoph Roch , Jonas Stein , Daniel Ratke , Claudia Linnhoff-Popien	
Quantum Neuron Selection: Finding High Performing Subnetworks With Quantum Algorithms	14:33
Tim Whitaker	
Panel Discussion	14:51
Closing Remarks	15:26

SAEOpt – Surrogate-Assisted Evolutionary Optimisation

Organizers: Alma Rahat, Swansea University, UK; Richard Everson, University of Exeter, UK; Jonathan Fieldsend, University of Exeter, UK; Handing Wang, Xidian University, China; Yaochu Jin, Bielefeld University, Germany; Tinkle Chugh, University of Exeter, UK

Time: Sunday, July 10, 16:00–17:50, Pacific B-C

Invited Talk: Perspectives to Dealing with Computationally Expensive Multiobjective Optimization Problems with Interactive Methods Kaisa Miettinen	16:00
Mono-surrogate vs Multi-surrogate in Multi-objective Bayesian Optimisation Tinkle Chugh	16:55
Flash Talks from GECCO Attendees, and Discussions	17:20

SecDef – Genetic and Evolutionary Computation in Defense, Security, and Risk Management

Organizers: Erik Hemberg, ALFA Group, MIT CSAIL, USA; Marwa Elsayed, Dalhousie University, Canada

Time: Sunday, July 10, 16:00–17:50, Pacific G-H

Welcome and Introduction	16:00
Invited talk: Applying Machine Learning to Cyber Security Nick Rutar	16:03
Chaos Engineering: Stress-Testing Algorithms to Facilitate Resilient Strategic Military Planning Samuel Migirditch , John Asplund , William Curran	16:47
CyberEvo: Evolutionary Search of Knowledge-based Behaviors in a Cyber Attack Campaign Stephen Moskal , Erik Hemberg , Una-May O'Reilly	17:02
Feature Encoding with Autoencoder and Differential Evolution for Network Intrusion Detection using Machine Learning Miguel Leon , Tijana Markovic , Sasikumar Punnekkat	17:17
Wrap-up	17:32

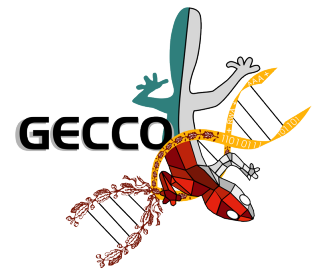
SymReg – Symbolic Regression

Organizers: Michael Kommenda, University of Applied Sciences Upper Austria, Austria; William La Cava, Boston Children's Hospital and Harvard Medical School, USA; Gabriel Kronberger, University of Applied Sciences Upper Austria, Austria; Steven Gustafson, Noonum Inc, USA

Time: Saturday, July 09, 16:00–17:50, Pacific F

Welcome & Opening Talk	16:00
Uncertainty in Equation Learning Matthias Werner , Andrej Junginger , Philipp Hennig , Georg Martius	16:10
Bingo: A Customizable Framework for Symbolic Regression with Genetic Programming David Randall , Tyler Townsend , Jacob Hochhalter , Geoffrey Bomarito	16:25
Interaction-Transformation Evolutionary Algorithm with coefficients optimization Guilherme Imai Aldeia , Fabrício de França	16:40
Coefficient Mutation in the Gene-pool Optimal Mixing Evolutionary Algorithm for Symbolic Regression Marco Virgolin , Peter Bosman	16:55
Genetic Programming with Stochastic Gradient Descent Revisited: Initial Findings on SRBench Grant Dick	17:10
Invited Talk From the Winner of the Symbolic Regression Competition	17:25
Closing Remarks	17:40

Papers



GECH 1★ Monday, July 11, 10:30–11:50, Atlantic 1

Chair: TBD

(Best Paper nominees are marked with a star)

Theory-inspired Parameter Control Benchmarks for Dynamic Algorithm Configuration★ 10:30
 André Biedenkapp, Nguyen Dang, Martin Krejca, Frank Hutter, Carola Doerr

Black-Box Min–Max Continuous Optimization Using CMA-ES with Worst-case Ranking Approximation★ 10:50
 Atsuhiko Miyagi, Kazuto Fukuchi, Jun Sakuma, Youhei Akimoto

Using Phylogenetic Analysis to Enhance Genetic Improvement 11:10
 Penny Rainford, Barry Porter

On Optimal Static and Dynamic Parameter Choices for Fixed-Target Optimization 11:30
 Dmitry Vinokurov, Maxim Buzdalov

ENUM 1 - Theory 1★ Monday, July 11, 10:30–11:50, Atlantic 2

Chair: TBD

(Best Paper nominees are marked with a star)

Crossover for Cardinality Constrained Optimization★ 10:30
 Tobias Friedrich, Timo Kötzing, Aishwarya Radhakrishnan, Leon Schiller, Martin Schirneck, Georg Tennigkeit, Simon Wietheger

CMA-ES with Margin: Lower-Bounding Marginal Probability for Mixed-Integer Black-Box Optimization★ 10:50
 Ryoki Hamano, Shota Saito, Masahiro Nomura, Shinichi Shirakawa

The Compact Genetic Algorithm Struggles on Cliff Functions 11:10
 Frank Neumann, Dirk Sudholt, Carsten Witt

NE 1 Monday, July 11, 10:30–11:50, Atlantic 3

Chair: TBD

RankNEAT: Outperforming Stochastic Gradient Search in Preference Learning Tasks 10:30
 Kosmas Pinitas, Konstantinos Makantasis, Antonios Liapis, Georgios Yannakakis

Diversity Policy Gradient for Sample Efficient Quality-Diversity Optimization 10:50
 Thomas Pierrot, Valentin Macé, Felix Chalumeau, Arthur Flajolet, Geoffrey Cideron, Karim Beguir, Antoine Cully, Olivier Sigaud, Nicolas Perrin-Gilbert

Approximating Gradients for Differentiable Quality Diversity in Reinforcement Learning 11:10
 Bryon Tjanaka, Matthew Fontaine, Julian Togelius, Stefanos Nikolaidis

Surrogate-Assisted Neuroevolution 11:30
 Bryson Greenwood, Tyler McDonnell

EMO 1 Monday, July 11, 10:30–11:50, Pacific A
Chair: TBD

- Unsupervised Comment-based Multi-document Extractive Summarization** 10:30
Vishal Roha, NAVEEN SAINI, SRIPARNA SAHA, JOSE MORENO
- A Bounded Archive Based for Bi-objective Problems based on Distance and epsilon-dominance to avoid Cyclic Behavior** 10:50
Oliver Schuetze, Carlos Hernandez
- A Classification-Assisted Level-based Learning Evolutionary Algorithm for Expensive Multiobjective Optimization Problems** 11:10
Zhuo Liu, Xiaolin Xiao, Feng-Feng Wei, Wei-Neng Chen
- Better Approximation Guarantees for the NSGA-II by Using the Current Crowding Distance** 11:30
Weijie Zheng, Benjamin Doerr
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GP 1 Monday, July 11, 10:30–11:50, Pacific B-C
Chair: TBD

- Graph-based Linear Genetic Programming: A Case Study of Dynamic Scheduling** 10:30
Zhixing Huang, Yi Mei, Fangfang Zhang, Mengjie Zhang
- Exploring Hidden Semantics in Neural Networks with Symbolic Regression** 10:50
Yuanzhen Luo, Qiang Lu, Xilei Hu, Jake Luo, Zhiguang Wang
- Measuring Failed Disruption Propagation in Genetic Programming** 11:10
william langdon, Afnan Al-Subaihin, David Clark
- Taylor Genetic Programming for Symbolic Regression** 11:30
Baihe He, Qiang Lu, Qingyun Yang, Jake Luo, Zhiguang Wang
-

ECOM 1 Monday, July 11, 10:30–11:50, Pacific F
Chair: TBD

- Improved Regression Models for Algorithm Configuration** 10:30
Marcelo de Souza, Marcus Ritt
- On Funnel Depths and Acceptance Criteria in Stochastic Local Search** 10:50
Sarah Thomson, Gabriela Ochoa
- What Makes The Dynamic Capacitated Arc Routing Problem Hard To Solve: Insights From Fitness Landscape Analysis** 11:10
Hao Tong, Leandro Minku, Stefan Menzel, Bernhard Sendhoff, Xin Yao
- Understanding the Cost of Fitness Evaluation for Subset Selection: Markov Chain Analysis of Stochastic Local Search** 11:30
Ole Jakob Mengshoel, Eirik Flogard, Tong Yu, Jon Riege
-

ACO-SI 1 Monday, July 11, 10:30–11:50, Caspian
Chair: TBD

- Measuring Optimiser Performance on a Conical Barrier Tree Benchmark** 10:30
Itshak Tkach, Tim Blackwell

A new Ant Colony Optimization metaheuristic based on Pheromone guided Local Search instead of Constructive approach	10:50
Samia Sammoud, Inès Alaya	
Social Learning Particle Swarm Optimization with Two-surrogate Collaboration for Offline Data-driven Multiobjective Optimization	11:10
Qi-Te Yang, Zhi-Hui Zhan, Yun Li, Jun Zhang	
Progressive Sampling Surrogate-Assisted Particle Swarm Optimization for Large-Scale Expensive Optimization	11:30
Hong-Rui Wang, Chun-Hua Chen, Yun Li, Jun Zhang, Zhi-Hui Zhan	
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GP 2★	Monday, July 11, 12:50–14:10, Atlantic 1
Chair: TBD	
<i>(Best Paper nominees are marked with a star)</i>	
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Evolvability Degeneration in Multi-Objective Genetic Programming for Symbolic Regression★	12:50
Dazhuang Liu, Marco Virgolin, Tanja Alderliesten, Peter Bosman	
Transformation-Interaction-Rational Representation for Symbolic Regression★	13:10
Fabricio de França	
Lexi²: Lexicase Selection with Lexicographic Parsimony Pressure	13:30
Allan de Lima, Samuel Carvalho, Douglas Dias, Enrique Naredo, Joseph Sullivan, Conor Ryan	
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EML 1★	Monday, July 11, 12:50–14:10, Atlantic 2
Chair: TBD	
<i>(Best Paper nominees are marked with a star)</i>	
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Multi-objective Framework for Quantile Forecasting in Financial Time Series Using Transformers★	12:50
Samuel López-Ruiz, Katya Rodríguez-Vázquez, Carlos Ignacio Hernández Castellanos	
Absumption based on Overgenerality and Condition-Clustering based Specialization for XCS with Continuous-Valued Inputs★	13:10
Hiroki Shiraishi, Yohei Hayamizu, Hiroyuki Sato, Keiki Takadama	
Diversifying behaviors for learning in Asymmetric Multiagent Systems★	13:30
Gaurav Dixit, Everardo Gonzalez, Kagan Tumer	
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NE 2	Monday, July 11, 12:50–14:10, Atlantic 3
Chair: TBD	
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Procedural Content Generation using Neuroevolution and Novelty Search for Diverse Video Game Levels	12:50
Michael Beukman, Christopher Cleghorn, Steven James	
Neuroevolution-Enhanced Multi-Objective Optimization for Mixed-Precision Quantization	13:10
Santiago Miret, Vui Seng Chua, Mattias Marder, Mariano Phielipp, Nilesh Jain, Somdeb Majumdar	

RWA 1	Monday, July 11, 12:50–14:10, Pacific A
Chair: TBD	
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Evolving Constructions for Balanced, Highly Nonlinear Boolean Functions	12:50
Claude Carlet, Marko Djurasevic, Domagoj Jakobovic, Luca Mariot, Stjepan Picek	
Bug Report Summarization using Multi-View Multi-Objective Optimization Framework	13:10
Santosh Mishra, Kundarapu Harshavardhan, Sayantan Mitra, Sriparna Saha, Pushpak Bhattacharyya	
EvoIsland: Interactive Evolution via an Island-Inspired Spatial User Interface Framework	13:30
Alexander Ivanov, Wesley Willett, Christian Jacob	
Addressing Tactic Volatility in Self-Adaptive Systems Using Evolved Recurrent Neural Networks and Uncertainty Reduction Tactics	13:50
Aizaz Ul Haq, Niranjana Deshpande, AbdElRahman ElSaid, Travis Desell, Daniel Krutz	
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HOP 1	Monday, July 11, 12:50–14:10, Pacific B-C
Chair: TBD	
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Evolutionary Generation of Metamorphic Relations for Cyber-Physical Systems	12:50
Jon Ayerdi, Valerio Terragni, Aitor Arrieta, Paolo Tonella, Goiuria Sagardui, Maite Arratibel	
Highlights of Semantics in Multi-objective Genetic Programming	13:00
Edgar Galván, Leonardo Trujillo, Fergal Stapleton	
Program Synthesis with Evolutionary Algorithms: Status Quo	13:10
Dominik Sobania, Dirk Schweim, Franz Rothlauf	
Long-Term Evolution Experiment with Genetic Programming [Hot of the Press]	13:20
William Langdon, Wolfgang Banzhaf	
Empirical linkage learning for non-binary discrete search spaces in the optimization of a large-scale real-world problem	13:30
Michal Przewozniczek, Marcin Komarnicki	
Generating Failing Test Suites for Quantum Programs with Search (Hot Off the Press track at GECCO 2022)	13:40
Xinyi Wang, Paolo Arcaini, Tao Yue, Shaukat Ali	
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RWA 2	Monday, July 11, 12:50–14:10, Caspian
Chair: TBD	
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Identifying the source of an epidemic using particle swarm optimization	12:50
John MaGee, Viplove Arora, Mario Ventresca	
Evolutionary Bi-objective Optimization for the Electric Vehicle Charging Stand Infrastructure Problem	13:10
Rolando Armas, Hernan Aguirre, Daniel Orellana	
Optimising Autonomous Robot Swarm Parameters for Stable Formation Design	13:30
Daniel Stolfi, Grégoire Danoy	

Automated Algorithm Selection for Radar Network Configuration 13:50
 Quentin Renau, Johann Dreo, Alain Peres, Yann Semet, Carola Doerr, Benjamin Doerr

CS 1★ Monday, July 11, 14:40–16:00, Atlantic 1

Chair: TBD

(Best Paper nominees are marked with a star)

Hierarchical Quality-Diversity for Online Damage Recovery★ 14:40
 Maxime Allard, Simón Smith, Konstantinos Chatzilygeroudis, Antoine Cully

Evolving Modular Soft Robots without Explicit Inter-Module Communication using Local Self-Attention★ 15:00

Federico Pigozzi, Yujin Tang, Eric Medvet, David Ha

Multi-Objective Quality Diversity Optimization 15:20
 Thomas Pierrot, Guillaume Richard, Karim Beguir, Antoine Cully

Relevance-guided Unsupervised Discovery of Abilities with Quality-Diversity Algorithms 15:40
 Luca Grillotti, Antoine Cully

GA 1★ Monday, July 11, 14:40–16:00, Atlantic 2

Chair: TBD

(Best Paper nominees are marked with a star)

The Influence of Noise on Multi-Parent Crossover for an Island Model GA★ 14:40
 Brahim Aboutaib, Andrew Sutton

Local Optima Organize into Lattices Under Recombination; An example using the Traveling Salesman Problem★ 15:00

L. Darrell Whitley, Gabriela Ochoa

Simple Genetic Operators are Universal Approximators of Probability Distributions (and other Advantages of Expressive Encodings)★ 15:20

Elliot Meyerson, Xin Qiu, Risto Miikkulainen

Reducing the Cost of Partition Crossover on Large MAXSAT Problems: The PX-Preprocessor 15:40
 Preston Dunton, Darrell Whitley

EML 2 Monday, July 11, 14:40–16:00, Atlantic 3

Chair: TBD

Understanding AutoML Search Spaces with Local Optima Networks 14:40
 Matheus Teixeira, Gisele Pappa

The Bayesian Learning Classifier System: Implementation, Replicability, Comparison with XCSF 15:00
 David Pätzelt, Jörg Hähner

Multi-modal multi-objective model-based genetic programming to find multiple diverse high-quality models 15:20

Evi Sijben, Tanja Alderliesten, Peter Bosman

Coevolutionary Generative Adversarial Networks for Medical Image Augmentation at Scale 15:40
Diana Flores, Erik Hemberg, Jamal Toutouh, Una-May O'Reilly

RWA 3 Monday, July 11, 14:40–16:00, Pacific A
Chair: TBD

RTune: A RocksDB Tuning System with Deep Genetic Algorithm 14:40
HUIJUN JIN, Jieun Lee, Sanghyun Park

Effects of Imputation Strategy on Genetic Algorithms and Neural Networks on a Binary Classification Problem 15:00
Esteban Segarra Martinez, Stephen Maldonado, Annie Wu, Ryan McMahan, Xinliang Liu, Blake Oakley

An Evolutionary Fragment-based Approach to Molecular Fingerprint Reconstruction 15:20
Tim Cofala, Oliver Kramer

Adapting Novelty towards Generating Antigens for Antivirus systems 15:40
Ritwik Murali, Shunmuga Velayutham C

HOP 2 Monday, July 11, 14:40–16:00, Pacific B-C
Chair: TBD

IOHanalyzer: Detailed Performance Analyses for Iterative Optimization Heuristics 14:40
Hao Wang, Diederick Vermetten, Furong Ye, Carola Doerr, Thomas Bäck

Tag-based Module Regulation for Genetic Programming 14:50
Alexander Lalejini, Matthew Moreno, Charles Ofria

Efficient Configuration of Optimization Algorithms 15:00
Marcelo de Souza, Marcus Ritt, Manuel López-Ibáñez

What Can Phylogenetic Metrics Tell us About Useful Diversity in Evolutionary Algorithms? 15:10
Jose Hernandez, Alexander Lalejini, Emily Dolson

Measuring the ability of lexibase selection to find obscure pathways to optimality 15:20
Jose Hernandez, Alexander Lalejini, Charles Ofria

A Verified Application of Genetic Programming: QoS Time Series Modeling and Forecasting for Web Services 15:30
Yang Syu, Chien-Min Wang, Yong-Yi Fanjiang

EMO 2 Monday, July 11, 14:40–16:00, Pacific G-H
Chair: TBD

Multi-Point Acquisition Function for Constraint Parallel Efficient Multi-Objective Optimization 14:40
Roy de Winter, Bas van Stein, Thomas Bäck

Region of Interest Based Non-dominated Sorting Genetic Algorithm-II: An Invite and Conquer Approach 15:00
Manu Manuel, Benjamin Hien, Simon Conrady, Arne Kreddig, Nguyen Anh Vu Doan, Walter Stechele

Cost-vs-Accuracy of Sampling in Multi-objective Combinatorial Exploratory Landscape Analysis	15:20
Raphaël Cosson, Bilel Derbel, Arnaud Liefoghe, Sébastien Verel, Hernan Aguirre, Zhang Qingfu, Kiyoshi Tanaka	
An Enhanced Adaptive Geometry Evolutionary Algorithm Using Stochastic Diversity Mechanism	15:40
Fodil Benali, Damien Bodénès, Cyril De Runz, Nicolas Labroche	
ECOM 2	Monday, July 11, 14:40–16:00, Pacific F
Chair: TBD	
On turning Black- into Dark Gray-optimization with the Direct Empirical Linkage Discovery and Partition Crossover	14:40
Michal Przewozniczek, Renato Tinós, Bartosz Frej, Marcin Komarnicki	
Exploring the Feature Space of TSP Instances Using Quality Diversity	15:00
Jakob Bossek, Frank Neumann	
Guided Local Search with an Adaptive Neighbourhood Size Heuristic for Large Scale Vehicle Routing Problems	15:20
Joao Guilherme Cavalcanti Costa, Yi Mei, Mengjie Zhang	
GP 3	Monday, July 11, 14:40–16:00, Caspian
Chair: TBD	
Functional Code Building Genetic Programming	14:40
Edward Pantridge, Thomas Helmuth, Lee Spector	
Genetic Programming for Structural Similarity Design at Multiple Spatial Scales	15:00
Illya Bakurov, Marco Buzzelli, Mauro Castelli, Raimondo Schettini, Leonardo Vanneschi	
Evolving Generalizable Multigrid-Based Helmholtz Preconditioners with Grammar-Guided Genetic Programming	15:20
Jonas Schmitt, Harald Köstler	
Co-evolutionary Probabilistic Structured Grammatical Evolution	15:40
Jessica Mégane, Nuno Lourenço, Penousal Machado	
SBSE 1 - NE 3★	Tuesday, July 12, 12:40–14:00, Atlantic 1
Chair: TBD <i>(Best Paper nominees are marked with a star)</i>	
Evolutionary Neural Cascade Search across Supernetworks★	12:40
Alexander Chebykin, Tanja Alderliesten, Peter Bosman	
Mutation-Based Test Generation for Quantum Programs with Multi-Objective Search★	13:00
Xinyi Wang, Tongxuan Yu, Paolo Arcaini, Tao Yue, Shaukat Ali	
RWA 4	Tuesday, July 12, 12:40–14:00, Atlantic 2
Chair: TBD	
Analyzing Multi-Agent Reinforcement Learning and Coevolution in Cybersecurity	12:40
Matthew Turner, Erik Hemberg, Una-May O'Reilly	

Genetic Algorithm for Qubits Initialisation in Noisy Intermediate-Scale Quantum Machines: The IBM Case Study	13:00
Zakaria Dahi, Francisco Chicano, Gabriel Luque, Enrique Alba	
Towards Explainable Real Estate Valuation via Evolutionary Algorithms	13:20
Sebastian Angrick, Ben Bals, Niko Hastrich, Maximilian Kleissl, Jonas Schmidt, Vanja Doskoč, Maximilian Katzmann, Louise Molitor, Tobias Friedrich	
EML 3	Tuesday, July 12, 12:40–14:00, Atlantic 3
Chair: TBD	
DiBB: Distributing Black-Box Optimization	12:40
Giuseppe Cuccu, Luca Rolshoven, Fabien Vorpe, Philippe Cudré-Mauroux, Tobias Glasmachers	
Can the Same Rule Representation Change its Matching Area? Enhancing Representation in XCS for Continuous Space by Probability Distribution in Multiple Dimension	13:00
Hiroki Shiraishi, Yohei Hayamizu, Hiroyuki Sato, Keiki Takadama	
Evolving Transferable Neural Pruning Functions	13:20
Yuchen Liu, Sun-Yuan Kung, David Wentzlaff	
Fitness Shaping For Multiple Teams	13:40
Joshua Cook, Kagan Tumer	
GECH 2	Tuesday, July 12, 12:40–14:00, Pacific A
Chair: TBD	
MBORE: Multi-objective Bayesian Optimisation by Density-Ratio Estimation	12:40
George De Ath, Tinkle Chugh, Alma Rahat	
Coevolutionary Pareto Diversity Optimization	13:00
Aneta Neumann, Denis Antipov, Frank Neumann	
High Performance Evolutionary Computation with Tensor-based Acceleration	13:20
Jonatan Klosko, Mateusz Benecki, Grzegorz Wcisło, Jacek Dajda, Wojciech Turek	
EMO 3	Tuesday, July 12, 12:40–14:00, Pacific G-H
Chair: TBD	
MOLE: Digging Tunnels Through Multimodal Multi-Objective Landscapes	12:40
Lennart Schäpermeier, Christian Grimme, Pascal Kerschke	
Reproducibility and Baseline Reporting for Dynamic Multi-objective Benchmark Problems	13:00
Daniel Herring, Michael Kirley, Xin Yao	
Multi-objective QUBO Solver: Bi-objective Quadratic Assignment Problem	13:20
Mayowa Ayodele, Richard Allmendinger, Manuel López-Ibáñez, Matthieu Parizy	
ECOM 3	Tuesday, July 12, 12:40–14:00, Pacific F
Chair: TBD	
Evolving Labelings of Graceful Graphs	12:40
Luke Branson, Andrew Sutton	

DRILS Revisited: On the Combination of Perturbation with Graybox Optimization Techniques Lorenzo Canonne, Bilel Derbel	13:00
Metaheuristic Algorithms for the Bus Driver Scheduling Problem with Complex Break Constraints Lucas Kletzander, Tommaso Mannelli Mazzoli, Nysret Musliu	13:20
Negative Learning Ant Colony Optimization for Network Alignment Guillem Rodríguez Corominas, Christian Blum, Maria J. Blesa	13:40
GP 4 Chair: TBD	Tuesday, July 12, 12:40–14:00, Caspian
Comparing Optimistic and Pessimistic Constraint Evaluation in Shape-constrained Symbolic Regression Christian Haider, Fabricio De França, Gabriel Kronberger, Bogdan Burlacu	12:40
Novel ensemble collaboration method for dynamic scheduling problems Marko Đurasević, Lucija Planinić, Francisco Javier Gil Gala, Domagoj Jakobović	13:00
Choose Your Programming Copilot: A Comparison of the Program Synthesis Performance of GitHub Copilot and Genetic Programming Dominik Sobania, Martin Briesch, Franz Rothlauf	13:20
Automated Grammar-based Feature Selection in Symbolic Regression Muhammad Sarmad Ali, Meghana Kshirsagar, Enrique Naredo, Conor Ryan	13:40
EMO 4★ Chair: TBD <i>(Best Paper nominees are marked with a star)</i>	Tuesday, July 12, 14:30–15:50, Atlantic 1
Component-wise Analysis of Automatically Designed Multiobjective Algorithms on Constrained Problems★ Yuri Lavinias, Marcelo Ladeira, Gabriela Ochoa, Claus Aranha	14:30
Multi-objective NK Landscapes with Heterogeneous Objectives★ Raphael Cosson, Roberto Santana, Bilel Derbel, Arnaud Liefoghe	14:50
The $(1 + (\lambda, \lambda))$ Global SEMO Algorithm★ Benjamin Doerr, Omar El Hadri, Adrien Pinard	15:10
RWA 5★ Chair: TBD <i>(Best Paper nominees are marked with a star)</i>	Tuesday, July 12, 14:30–15:50, Atlantic 2
Learning the Characteristics of Engineering Optimization Problems with Applications in Automotive Crash★ Fu Xing Long, Bas van Stein, Moritz Frenzel, Peter Krause, Markus Gitterle, Thomas Bäck	14:30
Adaptive Objective Configuration in Bi-Objective Evolutionary Optimization for Cervical Cancer Brachytherapy Treatment Planning★ Leah Dickhoff, Ellen Kerkhof, Heloisa Deuzeman, Carien Creutzberg, Tanja Alderliesten, Peter Bosman	14:50

High-performance Evolutionary Algorithms For Online Neuronal Control★	15:10
Binxu Wang, Carlos Ponce	
Defending Active Directory by Combining Neural Network based Dynamic Program and Evolutionary Diversity Optimisation	15:30
Diksha Goel, Max Ward-Graham, Aneta Neumann, Frank Neumann, Hung Nguyen, Mingyu Guo	

EML 4	Tuesday, July 12, 14:30–15:50, Atlantic 3
Chair: TBD	

Pittsburgh Learning Classifier Systems for Explainable Reinforcement Learning: Comparing with XCS	14:30
Jordan Bishop, Marcus Gallagher, Will Browne	
Hyperparameter Tuning in Echo State Networks	14:50
Filip Matzner	

GECH 3	Tuesday, July 12, 14:30–15:50, Pacific A
Chair: TBD	

Guiding Surrogate-Assisted Multi-Objective Optimisation With Decision Maker Preferences	14:30
Finley Gibson, Richard Everson, Jonathan Fieldsend	
Hard Problems are Easier for Success-based Parameter Control	14:50
Mario Hevia Fajardo, Dirk Sudholt	
Improving LSHADE by means of a pre-screening mechanism	15:10
Mateusz Zaborski, Jacek Mańdziuk	
Are Evolutionary Algorithms Safe Optimizers?	15:30
Youngmin Kim, Richard Allmendinger, Manuel López-Ibáñez	

ENUM 2	Tuesday, July 12, 14:30–15:50, Pacific B-C
Chair: TBD	

The Importance of Landscape Features for Performance Prediction of Modular CMA-ES Variants	14:30
Ana Kostovska, Diederick Vermetten, Sašo Džeroski, Carola Doerr, Peter Korošec, Tome Eftimov	
Learning Rate Adaptation by Line Search in Evolution Strategies with Recombination	14:50
Armand Gissler, Anne Auger, Nikolaus Hansen	
SELECTOR: Selecting a Representative Benchmark Suite for Reproducible Statistical Comparison	15:10
Gjorgjina Cenikj, Ryan Lang, Andries Engelbrecht, Carola Doerr, Peter Korošec, Tome Eftimov	
A Collection of Deep Learning-based Feature-Free Approaches for Characterizing Single-Objective Continuous Fitness Landscapes	15:30
Moritz Seiler, Raphael Prager, Pascal Kerschke, Heike Trautmann	

CS 2	Tuesday, July 12, 14:30–15:50, Pacific G-H
Chair: TBD	

Minimal Neural Network Models for Permutation Invariant Agents	14:30
Joachim Pedersen, Sebastian Risi	

Hybridizing Bio-Inspired Strategies with Infotaxis through Genetic Programming	14:50
João Macedo, Lino Marques, Ernesto Costa	
Deep Surrogate Assisted MAP-Elites for Automated Hearthstone Deckbuilding	15:10
Yulun Zhang, Matthew Fontaine, Amy Hoover, Stefanos Nikolaidis	
Evolving Programmable Computational Metamaterials	15:30
Atoosa Parsa, Dong Wang, Corey O'Hern, Mark Shattuck, Rebecca Kramer-Bottiglio, Josh Bongard	

ECOM 4	Tuesday, July 12, 14:30–15:50, Pacific F
Chair: TBD	

A Biased Random Key Genetic Algorithm Applied to Target Set Selection in Viral Marketing	14:30
Albert López Serrano, Christian Blum	
Efficient Heuristics and Metaheuristics for the Unrelated Parallel Machine Scheduling Problem With Release Dates and Setup Times	14:50
Mohamed Elamine Athmani, Taha Arbaoui, Younes Mimene, Farouk Yalaoui	

Theory 2	Tuesday, July 12, 14:30–15:50, Caspian
Chair: TBD	

Self-adaptation via Multi-objectivisation: A Theoretical Study	14:30
Per Kristian Lehre, Xiaoyu Qin	
Runtime Analysis of Competitive co-Evolutionary Algorithms for Maximin Optimisation of a Bilinear Function	14:50
Per Kristian Lehre	
Fast Non-elitist Evolutionary Algorithms with Power-law Ranking Selection	15:10
Duc-Cuong Dang, Anton Ereemeev, Per Kristian Lehre, Xiaoyu Qin	

SBSE 2	Tuesday, July 12, 16:20–17:40, Atlantic 1
Chair: TBD	

Is the Revisited Hypervolume an Appropriate Quality Indicator to Evaluate Multi-Objective Test Case Selection Algorithms?	16:20
Aitor Arrieta	
Multi-Objective Metamorphic Follow-up Test Case Selection for Deep Learning Systems	16:40
Aitor Arrieta	
Improving Source-Code Representations to Enhance Search-based Software Repair	17:00
Pemma Reiter, Antonio Espinoza, Ruoyu "Fish" Wang, Adam Doupe, Westley Weimer, Stephanie Forrest	

ECOM 5★	Tuesday, July 12, 16:20–17:40, Atlantic 2
Chair: TBD	
<i>(Best Paper nominees are marked with a star)</i>	

Iterated Local Search with Perturbation based on Variables Interaction for Pseudo-Boolean Optimization★	16:20
Renato Tinós, Michal Przewozniczek, Darrell Whitley	

Local Ranking Explanation for Genetic Programming Evolved Routing Policies for Uncertain Capacitated Arc Routing Problems★ 16:40
Shaolin Wang, Yi Mei, Mengjie Zhang

On the Use of Quality Diversity Algorithms for The Traveling Thief Problem★ 17:00
Adel Nikfarjam, Aneta Neumann, Frank Neumann

ACO-SI 2 Tuesday, July 12, 16:20–17:40, Atlantic 3
Chair: TBD

Environment induced emergence of collective behaviour in evolving swarms with limited sensing 16:20
Fuda van Diggelen, Tugay Alperen Karagüzel, Jie Luo, Eliseo Ferrante, Nicolas Cambier, A.E. Eiben

PLAN: A Leafcutter Ant Colony Optimization Algorithm for Ride-Hailing Services 16:40
Anoushka Alavilli, Mai Vu

GECH 4 Tuesday, July 12, 16:20–17:40, Pacific A
Chair: TBD

Expensive Optimization with Production-Graph Resource Constraints: A First Look at a New Problem Class 16:20
Stefan Pricopie, Richard Allmendinger, Manuel López-Ibáñez, Clyde Fare, Matt Benatan, Joshua Knowles

Boomerang-shaped Neural Embeddings for NK Landscapes 16:40
Roberto Santana, Arnaud Liefoghe, Bilel Derbel

Analyzing the Impact of Undersampling on the Benchmarking and Configuration of Evolutionary Algorithms 17:00
Diederick Vermetten, Hao Wang, Carola Doerr, Manuel López-Ibáñez, Thomas Bäck

HOP 3 Tuesday, July 12, 16:20–17:40, Pacific B-C
Chair: TBD

Targeting Requirements Violations of Autonomous Driving Systems by Dynamic Evolutionary Search (HOP at GECCO'22) 16:20
Yixing Luo, Xiao-Yi Zhang, Paolo Arcaini, Zhi Jin, Haiyan Zhao, Fuyuki Ishikawa, Rongxin Wu, Tao Xie

A comparison of Rule Compaction Algorithms for Michigan Style Learning Classifier Systems 16:30
Yi Liu, Will Browne, Bing Xue

Genetic Programming Convergence 16:40
William Langdon

Archivers for Single- and Multi-objective Evolutionary Optimization Algorithms 16:50
Oliver Schuetze, Carlos Hernández Castellanos

CS 3 Tuesday, July 12, 16:20–17:40, Pacific G-H
Chair: TBD

EvoRobogami: Co-designing with Humans in Evolutionary Robotics Experiments 16:20
Huang Zonghao, Quinn Wu, David Howard, Cynthia Sung

Adaptive Phototaxis of a Swarm of Mobile Robots using Positive and Negative Feedback Self-Alignment 16:40

Yoones Mirhosseini, Matan Yah Ben Zion, Olivier Dauchot, Nicolas Bredeche

GA 2

Tuesday, July 12, 16:20–17:40, Pacific F

Chair: TBD

Solving Multi-Structured Problems by Introducing Linkage Kernels into GOMEA 16:20

Arthur Guijt, Dirk Thierens, Tanja Alderliesten, Peter Bosman

Effective Mutation Rate Adaptation through Group Elite Selection 16:40

Akarsh Kumar, Bo Liu, Risto Miikkulainen, Peter Stone

GPU-Accelerated Parallel Gene-Pool Optimal Mixing in a Gray-Box Optimization Setting 17:00

Anton Bouter, Peter Bosman

LUCIE: An Evaluation and Selection Method for Stochastic Problems 17:20

Erwan Lecarpentier, Paul Templier, Emmanuel Rachelson, Dennis Wilson

Theory 3

Tuesday, July 12, 16:20–17:40, Caspian

Chair: TBD

Towards a Stronger Theory for Permutation-based Evolutionary Algorithms 16:20

Benjamin Doerr, Yassine Ghannane, Marouane Ibn Brahim

Monotone Improvement of Information-Geometric Optimization Algorithms with a Surrogate Function 16:40

Youhei Akimoto

Simulated Annealing is a Polynomial-Time Approximation Scheme for the Minimum Spanning Tree Problem 17:00

Benjamin Doerr, Amirhossein Rajabi, Carsten Witt

Analysis of a Gray-Box Operator for Vertex Cover 17:20

Samuel Baguley, Tobias Friedrich, Timo Kötzing, Xiaoyue Li, Marcus Pappik, Ziena Zeif

NE 4

Wednesday, July 13, 09:00–10:20, Atlantic 1

Chair: TBD

PRE-NAS: Predictor-assisted Evolutionary Neural Architecture Search 09:00

Yameng Peng, Andy Song, Vic Ciesielski, Haytham Fayek, Xiaojun Chang

Dynamics-Aware Novelty Search With Behavior Repulsion 09:20

Kang Xu, Yan Ma, Wei Li

Neural Architecture Search Using Progressive Evolution 09:40

Nilotpal Sinha, Kuan-Wen Chen

RWA 6

Wednesday, July 13, 09:00–10:20, Atlantic 2

Chair: TBD

A Multi-objective Evolutionary Algorithm with New Reproduction and Decomposition Mechanisms for the Multi-Point Dynamic Aggregation Problem 09:00

Guanqiang Gao, Bin Xin, Yi Mei, Shengyu Lu, Shuxin Ding

Environment Driven Dynamic Decomposition for Cooperative Co-evolution of Multi-Agent Systems 09:20

Luke Kelly, Martin Masek, Chiou Peng Lam

Swarm Led Tomographic Reconstruction 09:40

Mohammad Majid al-Rifaie, Tim Blackwell

EML 5

Wednesday, July 13, 09:00–10:20, Atlantic 3

Chair: TBD

Evolutionary Feature Selection: A Novel Wrapper Feature Selection Architecture Based on Evolutionary Strategies 09:00

Aaryan Dubey, Alexandre Inoue, Pedro Birmann, Sammuell Silva

On genetic programming representations and fitness functions for interpretable dimensionality reduction 09:20

Thomas Uriot, Marco Virgolin, Tanja Alderliesten, Peter Bosman

Assessing Evolutionary Terrain Generation Methods for Curriculum Reinforcement Learning 09:40

David Howard, Humphrey Munn, Davide Dolcetti, Joshua Kannemeyer, Nicole Robinson

EMO 5

Wednesday, July 13, 09:00–10:20, Pacific A

Chair: TBD

Parallelization of Corner Sort with CUDA for Many-Objective Optimization 09:00

Vandana Bharti, Aryan Singhal, Anant Saxena, Bhaskar Biswas, Kaushal Kumar Shukla

An Improved Pareto Front Modeling Algorithm for Large-scale Many-Objective Optimization 09:20

Annibale Panichella

A Two-phase Framework with a Bezier Simplex-based Interpolation Method for Computationally Expensive Multi-objective Optimization 09:40

Ryoji Tanabe, Youhei Akimoto, Ken Kobayashi, Hiroshi Umeki, Shinichi Shirakawa, Naoki Hamada

HOP 4

Wednesday, July 13, 09:00–10:20, Pacific B-C

Chair: TBD

Precise Runtime Analysis for Plateau Functions 09:00

Denis Antipov, Benjamin Doerr

Automated Configuration of Genetic Algorithms by Tuning for Anytime Performance 09:10

Furong Ye, Carola Doerr, Hao Wang, Thomas Bäck

Choosing the Right Algorithm With Hints From Complexity Theory (Hot-off-the-Press Track at GECCO 2022) 09:20

Shouda Wang, Weijie Zheng, Benjamin Doerr

Modular Grammatical Evolution for the Generation of Artificial Neural Networks (Hot-off-the-Press Track at GECCO 2022) 09:30

Khabat Soltanian, Ali Ebneenasir, Mohsen Afsharchi

A First Mathematical Runtime Analysis of the Non-dominated Sorting Genetic Algorithm II (NSGA-II) (Hot-off-the-Press Track at GECCO 2022) 09:40

Weijie Zheng, Yufei Liu, Benjamin Doerr

CS + IMPACT

Wednesday, July 13, 09:00–10:20, Pacific G-H

Chair: TBD

Plasticity and Evolvability Under Environmental Variability: the Joint Role of Fitness-based Selection and Niche-limited Competition 09:00

Eleni Nisioti, Clément Moulin-Frier

Learning to Walk Autonomously via Reset-Free Quality-Diversity 09:20

Bryan Lim, Alexander Reichenbach, Antoine Cully

Illuminating Diverse Neural Cellular Automata for Level Generation 09:40Sam Earle, Justin Snider, Matthew Fontaine, Stefanos Nikolaidis, Julian Togelius

GA 3

Wednesday, July 13, 09:00–10:20, Pacific F

Chair: TBD

Evolutionary Diversity Optimisation for The Traveling Thief Problem 09:00

Adel Nikfarjam, Aneta Neumann, Frank Neumann

TAGA: A Transfer-based Black-box Adversarial Attack with Genetic Algorithms 09:20

Liang-Jung Huang, Tian-Li Yu

Niching-based Evolutionary Diversity Optimization for the Traveling Salesperson Problem 09:40

Anh Do, Mingyu Guo, Aneta Neumann, Frank Neumann

Posters



Ant Colony Optimization and Swarm Intelligence (ACO-SI)**Particle Swarm Optimization with Average-Fitness Based Selection**

Stephen Chen, Shanshan Lao, Irene Moser

Ant Colony Optimization for Feature Selection via a Filter-Randomized Search Heuristic

Alberto Ortega, Juan José Escobar, Miguel Damas, Andrés Ortiz, Jesús González

A Chaotic Parallel Antlion Optimization Algorithm for Feature Selection

Xun Zhou, Hongwei Chen, Deiwai Shi

Cooperative Attack-Defense Evolution of Large-Scale Agents: A Multi-Population High-Dimensional Mean-Field Game Approach

Guofang Wang, Xiao Zhang, Wang Yao, Lu Ren

Ant Colony Optimization with Shortest Route Biased Dispatch for Visiting Constrained Multiple Traveling Salesmen Problem

Cong Bao, Qiang Yang, Xu-Dong Gao, Zhen-Yu Lu, Jun Zhang

Dropout Topology-Assisted Bidirectional Learning Particle Swarm Optimization for Neural Architecture Search

Ye-Qun Wang, Chun-Hua Chen, Jun Zhang, Zhi-Hui Zhan

Complex Systems (Artificial Life/Artificial Immune Systems/Generative and Developmental Systems/Evolutionary Robotics/Evolvable Hardware) (CS)**Comparison of Evolutionary Multi-Objective Optimization Algorithms Using Imitation Game**

Yuji Sato, Yoshihisa Murakawa

Minimize Surprise MAP-Elites: A Task-Independent MAP-Elites Variant for Swarms

Tanja Katharina Kaiser, Heiko Hamann

Do Harsher Environments cause Selfish or Altruistic Behavior?

Geoff Nitschke, Brandon Gower-Winter

CoBEA: Framework for Evolving Hardware by Direct Manipulation of FPGA Bitstreams

Joern Hoffmann, Clemens Fritsch, Martin Bogdan

QDax: On the Benefits of Massive Parallelization for Quality-Diversity

Bryan Lim, Maxime Allard, Luca Grillotti, Antoine Cully

Geodesics, Non-linearities and the Archive of Novelty Search

Achkan Salehi, Alexandre Coninx, Stephane Doncieux

Using Evolutionary Game Theory to Understand Scalability in Task Allocation

Mostafa Rizk, Julian Garcia, Aldeida Aleti, David Green

A Comparative Analysis on Genome Pleiotropy for Evolved Soft Robots

Dries Marzougui, Matthijs Biondina, Francis wyffels

De-redundancy in a Random Boolean Network Using Knockout

Junxiu Liu, Jufang Dai, Min Su, Shunsheng Zhang, Yifan Hua, Yanhu Wang, Haiping Shu

AutoMoDe-Pomodoro: An Evolutionary Class of Modular Designs

Nicolas Cambier, Eliseo Ferrante

Selecting Continuous Life-Like Cellular Automata for Halting Unpredictability: Evolving for Abiogenesis

Quintin Davis, Josh Bongard

Growth-Based Morphological Development: A Natural Approach to Fitness Landscape Shaping

Martin Naya-Varela, Andrés Faina, Richard Duro

A Single Neural Cellular Automaton for Body-Brain Co-evolution

Sidney Pontes-Filho, Kathryn Walker, Elias Najarro, Stefano Nichele, Sebastian Risi

Empowered Neural Cellular Automata

Caitlin Grasso, Josh Bongard

Effects of encodings and quality-diversity on evolving 2D virtual creatures

Frank Veenstra, Martin Olsen, Kyrre Glette

Evolving Robot Bodies with a Sense of Direction

Emiel Maarten Willem Kempen, Agoston E. Eiben

Diversification Techniques and Distance Measures in Evolutionary Design of 3D Structures

Adam Klejda, Maciej Komosinski, Agnieszka Mensfelt

Evolutionary Combinatorial Optimization and Metaheuristics (ECOM)**Cooperative Co-Evolutionary Memetic Algorithm for Pickup and Delivery Problem with Time Windows**

Miroslaw Blocho, Tomasz Jastrzab, Jakub Nalepa

On the Fitness Landscapes of Interdependency Models in the Travelling Thief Problem

Mohamed El Yafrani, Marcella Martins, Myriam Delgado, Ricardo Lüders, Peter Nielsen, Markus Wagner

Neighbours Similar Fitness and the Effectiveness of Restarting Local Search

Aldeida Aleti, Mark Wallace, Markus Wagner

Exact and Sequential Penalty Weights in Quadratic Unconstrained Binary Optimisation with a Digital Annealer

Marcos Diez García, Mayowa Ayodele, Alberto Moraglio

Policy Network for Solving Flexible Job Shop Scheduling Problem With Setup Times and Rescure Constraints

Ning Xu, Tian-Ming Bu

Multi-workflow Scheduling in Industrial Edge: A Genetic Algorithm with Heuristic Strategy

Xiang-Ling Chen, Zhi-Xuan Zhang, Ming-Can Geng, Wei-Neng Chen

External Archive Hybrid Genetic Algorithm for Unequal Area Facility Layout Problem

Ailing Shen, Juan Lin, Yiwen Zhong

Towards Evolutionary Self-Optimization of Large Multi-Agent Systems

Franciszek Seredyński, Tomasz Kulpa, Rolf Hoffmann

A Hyper-Heuristic Approach for the PDPTW

Amir Nasiri, Edward Keedwell, Raphael Dorne, Mathias Kern, Gilbert Owusu

Exploiting Landscape Features for Fitness Prediction in University Timetabling

Thomas Feutrier, Nadarajen Veerapen, Marie-Éléonore Kessaci

Multilevel Memetic Hypergraph Partitioning with Greedy Recombination

Utku Acikalin, Bugra Caskurlu

Evolutionary Machine Learning (EML)

EvoJAX: Hardware-Accelerated Neuroevolution

Yujin Tang, Yingtao Tian, David Ha

On stochastic evolving algorithms

Iztok Fister Jr., Iztok Fister

Evolvable Hybrid Ensembles for Musical Genre Classification

Daniel Kostrzewa, Michal Ciszynski, Robert Brzeski

Cascades of Evolutionary Support Vector Machines

Wojciech Dudzik, Jakub Nalepa, Michal Kawulok

DEvS: Data Distillation Algorithm Based on Evolution Strategy

Nadiya Shvai, Arcadi Llanza Carmona, Abul Hasnat, Amir Nakib

Binary and Multinomial Classification through Evolutionary Symbolic Regression

Moshe Sipper

Evolving Convolutional Neural Networks for Intrusion Detection System Using Hybrid Multi-Strategy Aquila Optimizer

Wei Sun, Qianmu Li, Pengchuan Wang, Jun Hou

Comparing different Metaheuristics for Model Selection in a Supervised Learning Classifier System

Jonathan Wurth, Michael Heider, Helena Stegherr, Roman Sraj, Jörg Hähner

Chaotic Genetic Bee Colony: Combining Chaos Theory and Genetic Bee Algorithm for Feature Selection in Microarray Cancer Classification

Sammuel Silva, Jadson Gertrudes

Multi-task Optimisation for Multi-objective Feature Selection in Classification

Jiabin Lin, Qi Chen, Bing Xue, Mengjie Zhang

Particle Swarm Optimisation for Sparsity-based Feature Selection in Multi-label Classification

Kaan Demir, Bach Nguyen, Bing Xue, Mengjie Zhang

A Distributed Particle Swarm Optimization Algorithm for Distributed Clustering

Zi-Xing Li, Xiao-Qi Guo, Wei-Neng Chen

Scalable Evolutionary Hierarchical Reinforcement Learning

Geoff Nitschke, Sasha Abramowitz

GA-Auto-PU: A Genetic Algorithm-based Automated Machine Learning System for Positive-Unlabeled Learning

Jack Saunders, Alex Freitas

Interpretable pipelines with evolutionarily optimized modules for reinforcement learning tasks with visual inputs

Leonardo Custode, Giovanni Iacca

Accelerated Pattern Search with Variable Solution Size for Simultaneous Instance Selection and Generation

Lam Le, Ferrante Neri, Dario Landa-Silva, Isaac Triguero

Cost-sensitive Classification Tree Induction as a Bi-level Optimization Problem

Rihab Said, Maha Elarbi, Slim Bechikh, Carlos A. Coello Coello, Lamjed Ben Said

Separating Rule Discovery and Global Solution Composition in a Learning Classifier System

Michael Heider, Helena Stegherr, Jonathan Wurth, Roman Sraj, Jörg Hähner

Fairness in Generative Modeling: do it Unsupervised!

Mariia Zameshina, Fabien Teytaud, Vlad Hosu, Nathanael Carraz, Laurent Najman, Olivier Teytaud, Markus Wagner

Entropy-Based Local Fitnesses for Evolutionary Multiagent Systems

Ayhan Alp Aydeniz, Anna Nickelson, Kagan Tumer

TGPGAN - Towards Expression-based Generative Adversarial Networks

Francisco Baeta, João Correia, Tiago Martins, Penousal Machado

A Comparative Study of GP-based and State-of-the-art Classifiers on a Synthetic Machine Learning Benchmark

Patryk Orzechowski, Paweł Renc, William La Cava, Jason Moore, Arkadiusz Sitek, Jarosław Wąs, Joost Wagenaar

Multi-fidelity optimization method with Asynchronous Generalized Island Model for AutoML

Israel Campero Jurado, Joaquin Vanschoren

MOPINNs: An Evolutionary Multi-Objective Approach to Physics-Informed Neural Networks

Taco de Wolff, Hugo Carrillo, Luis Martí, Nayat Sánchez-Pi

Balancing Teams with Quality-Diversity for Heterogeneous Multiagent Coordination

Gaurav Dixit, Kagan Tumer

Bootstrapped Fitness Critics with Bidirectional Temporal Difference

Golden Rockefeller, Kagan Tumer

Designing a Novel and High Performance Algorithmic Trading Model using Evolutionary AutoML and Technical Analysis

Abhiram Tirumala, Rishi Bhatnager, Sriram Mudireddy, Pranav Manjunath, Jason Zutty

KDE-GAN: Enhancing Evolutionary GAN With Knowledge Distillation and Transfer Learning

Zheping Liu, Andy Song, Nasser Sabar

Evolutionary Multiobjective Optimization (EMO)**Multi-Objective Counterfactual Fairness**

Susanne Dandl, Florian Pfisterer, Bernd Bischl

Estimating the Quality of Initial Populations in Multi-Objective Evolutionary Algorithms

Tobias Benecke, Sanaz Mostaghim

BOBEA : A Bi-Objective Biclustering Evolutionary Algorithm for Genome-Wide Association Analysis

Ons Maatouk, Emna Ayari, Hend Bouziri, Wassim Ayadi

A Constraint Cone Decomposition Evolutionary Algorithm with Dual Populations

Wei Qin Ying, Yanqi Lan, Yu Wu, Xuanda Pan, Banban Huang, Jianyi Peng

Learning to Balance Exploration and Exploitation in Pareto Local Search for Multi-objective Combinatorial Optimization

Haotian Zhang, Jialong Shi, Jianyong Sun, Zongben Xu

Exploring the Decision and Objective Space of SAT Constrained Multi-Objective Problems

Felipe Honjo Ide, Hernan Aguirre, Minami Miyakawa, Darrell Whitley

An Analysis on Effectiveness of Estimated Convergence Points for Enhancement of Multi-objective Optimization Algorithms

Yuhei Yamaya, Yan Pei

Extending the Push and Pull Search Framework with Boundary Search for Constrained Multi-Objective Optimization

Erling Wisløff, Marius Aarsnes, Kazi Shah Nawaz Ripon, Pauline Haddow

Towards Multi-Objective Optimization of Sustainable Insect Production Chains

Nisrine Mouhrim, Sergiy Smetana, Anita Bhaita, Alexander Mathys, Ashley Green, Daniela Peguero, Alberto Tonda

Application of Nature Inspired Algorithms to Multi-objective Optimization of New Generation Network Problem

Stanislaw Kozdrowski, Kacper Wnuk

The Effect of Epigenetic Blocking on Dynamic Multi-Objective Optimisation Problems

Sizhe Yuen, Thomas Ezard, Adam Sobey

A Novel Evolutionary Framework Based on a Family Concept for Solving Multi-objective Bilevel Optimization Problems

Jesus-Adolfo Mejia-de-Dios, Alejandro Rodriguez-Molina, Efren Mezura-Montes

A Computationally Fast but Approximate MIP-DoM Calculation for Multi-Objective Optimization

Claudio Lopes, Flávio Martins, Elizabeth Wanner, Kalyanmoy Deb

On the Potential of Automated Algorithm Configuration on Multi-Modal Multi-Objective Optimization Problems

Jeroen Rook, Heike Trautmann, Jakob Bossek, Christian Grimme

Surrogate Models for IoT Task Allocation Optimization

Dominik Weikert, Christoph Steup, Sanaz Mostaghim

Fair Feature Subset Selection using Multiobjective Genetic Algorithm

Ayaz Ur Rehman, Anas Nadeem, Muhammad Zubair Malik

Evolutionary Numerical Optimization (ENUM)**Distributed Evolution Strategies for Large Scale Optimization**

Qiqi Duan, Guochen Zhou, Chang Shao, Yijun Yang, Yuhui Shi

A Layered Learning Estimation of Distribution Algorithm

Yong Li, Qiang Yang, Xu-Dong Gao, Zhen-Yu Lu, Jun Zhang

A Hybrid Self-Adapting Multi-Swarm Algorithm Based on PSO and CMA-ES for Continuous Dynamic Optimization

Shakhnaz Akhmedova, Vladimir Stanovov, Aleksei Vakhnin

Dynamic Perturbation for Population Diversity Management in Differential Evolution

Le Van Cuong, Nguyen Ngoc Bao, Nguyen Khanh Phuong, Huynh Thi Thanh Binh

A Novel Dynamic Analysis on Multi-scale Quantum Harmonic Oscillator Algorithm Using Double-well Function

Guosong Yang, Peng Wang, Xinyu Yin

Improving the Differential Evolution Strategy by coupling it with CMA-ES

Eryk Warchulski, Jarosław Arabas, Rafał Biedrzycki

The Effect of Mirrored Sampling with active CMA and Sample Reuse in the CMAES-APOP Algorithm

Duc Manh Nguyen

Genetic Algorithms (GA)**Boosting the Convergence of a GA-based Wrapper for Feature Selection Problems on High-dimensional Data**

Juan Gómez-López, Juan Escobar, Antonio Díaz, Miguel Damas, Francisco Gil-Montoya, Jesus González

Evolutionary Constrained Multi-task Optimization: Benchmark Problems and Preliminary Results

Yanchi Li, Wenyin Gong, Shuijia Li

Initialization method of genetic algorithm based on improved clustering algorithm

Hao Li, XueSong Jiang, Xiumei Wei

Neural Architecture Search Using Genetic Algorithm for Facial Expression Recognition

Shuchao Deng, Yanan Sun, Galvan Edgar

Trimming, Ordering, and Similarity Check for DSMGA-II

Ching-Chung Huang, Tian-Li Yu

Black-Box Adversarial Attack via Overlapped Shapes

Phoenix Williams, Ke Li, Geyong Min

Improving DSMGA-II Performance on Hierarchical Problems by Introducing Preservative Back Mixing

Chi-Meng Ngai, Tian-Li Yu

Quantum-Enhanced Selection Operators for Evolutionary Algorithms

David Von Dollen, Sheir Yarkoni, Daniel Weimer, Florian Neukart, Thomas Bäck

A GA based Approach for Solving Ring Design Telecommunication Network

Eisa Alblooshi, Ahmad Alblooshi, Kin Poon, Anis Ouali

Networks of evolution: Modelling and deconstructing genetic algorithms

Clodomir Santana, Edward Keedwell, Ronaldo Menezes

The pole balancing problem from the viewpoint of system flexibility

Léo Françoso Dal Piccol Sotto, Sebastian Mayer, Jochen Garcke

An Edge Quality Aware Crossover Operator for Application to the Capacitated Vehicle Routing Problem

Darren Chitty, William Yates, Edward Keedwell

Quantum Strategy of Population Initialization in Genetic Algorithm

Jun Suk Kim, Chang Wook Ahn

Evolutionary operation settings for outcome accumulation type evolutionary rule discovery method

Shogo Matsuno, Kaoru Shimada

Adversarial Example Generation via Genetic Algorithm: A Preliminary Result

Shasha Zhou, Ke Li, Geyong Min

General Evolutionary Computation and Hybrids (GECH)

A Surrogate Model-based Genetic Algorithm for the Optimal Policy in Cart-pole Balancing Environments

Seung-Soo Shin, Yong-Hyuk Kim

Independent Influence of Exploration and Exploitation for Metaheuristic-based Recommendations

Alexandre Bettinger, Armelle Brun, Anne Boyer

Localized Distance and Time-based Differential Evolution for Multimodal Optimization Problems

Hong Zhao, Jia Li, Jing Liu

Benchmarking Algorithm Portfolio Construction Methods

Mario Muñoz Acosta, Hamed Soleimani, Sevvandi Kandanaarachchi

Dynamic Multi-objective Ensemble of Acquisition Functions in Batch Bayesian Optimization

Jixiang Chen, Fu Luo, Zhenkun Wang

Using Domain Knowledge in Coevolution and Reinforcement Learning to Simulate a Logistics Enterprise

Ying Zhao, Erik Hemberg, Nate Derbinsky, Gabino Mata, Una-May O'Reilly

Improved data clustering using multi-trial vector-based differential evolution with Gaussian crossover

Parham Hadikhani, Daphne Lai, Wee-Hong Ong, Mohammad H.Nadimi-Shahraki

Enhancing MOEA/D with Learning: Application to Routing Problems with Time Windows

Clément Legrand, Diego Cattaruzza, Laetitia Jourdan, Marie-Eléonore Kessaci

Implementing and Evaluating Parallel Evolutionary Algorithms in Modern GPU Computing Libraries

Patrik Valkovič, Martin Pilát

Dynamic evaluation of Decomposition Methods for Large-Scale Optimization Problems using an Island Model

Grasiele Duarte, Beatriz Lima

Reduction of Genetic Drift in Population-Based Incremental Learning via Entropy Regularization

Ryoki Hamano, Shinichi Shirakawa

Fitness Diversification in the Service of Fitness Optimization: a Comparison Study

Kamil Basiukajc, Maciej Komosinski, Konrad Miazga

Genetic Programming (GP)

On the interaction between Lexicase Selection, Modularity and Data Subsets

Benjamin Portman, Malcolm Heywood

Benchmarking Genetic Programming in a Multi-action Reinforcement Learning Locomotion Task

Ryan Amaral, Alexandru Ianta, Caleidgh Bayer, Robert Smith, Malcolm Heywood

A preliminary study of Prediction Interval Methods with Genetic Programming

Karina Brotto Rebuli, Mario Giacobini, Niccolò Tallone, Leonardo Vanneschi

On the Effect of Embedding Hierarchy within Multi-Objective Optimization for Evolving Symbolic Regression Models

Atif Rafiq, Enrique Naredo, Meghana Kshirsagar, Conor Ryan

Genetic Programming with Diverse Partner Selection for Dynamic Flexible Job Shop Scheduling

Meng Xu, Yi Mei, Fangfang Zhang, Mengjie Zhang

Genetic Programming with External Memory in Sequence Recall Tasks

Mihyar Al Masalma, Malcolm Heywood

Active Learning Improves Performance on Regression Tasks in StackGP

Nathaniel Haut, Wolfgang Banzhaf, Bill Punch

Large Scale Image Classification Using GPU-based Genetic Programming

Peng Zeng, Andrew Lensen, Yanan Sun

Imbalanced Classification with TPG Genetic Programming: Impact of Problem Imbalance and Selection Mechanisms

Nicolas Sourbier, Justine Bonnot, Olivier Gesny, Frédéric Majorczyk, Karol Desnos, Thomas Guyet, Maxime Pelcat

Analyzing Optimized Constants in Genetic Programming on a Real-World Regression Problem

Dominik Sobania, Martin Briesch, David Wittenberg, Franz Rothlauf

Denosing Autoencoder Genetic Programming for Real-World Symbolic Regression

David Wittenberg, Franz Rothlauf

Failed Disruption Propagation in Integer Genetic Programming

William Langdon

Incorporating Sub-programs as Knowledge in Program Synthesis by PushGP and Adaptive Replacement Mutation

Yifan He, Claus Aranha, Tetsuya Sakurai

Compositional Genetic Programming for Symbolic Regression

Krzysztof Krawiec, Dominik Kosiński

Evolving Parsimonious Circuits through Shapley Value-based Genetic Programming

Xinming Shi, Jiashi Gao, Leandro Minku, Xin Yao

Regulatory Genotype-to-Phenotype Mappings Improve Evolvability in Genetic Programming

Jinting Zhang, Ting Hu

Automatically Evolving Malice Scoring Models through Utilisation of Genetic Programming: A Cooperative Coevolution Approach

Taran Cyriac John, Muhammad Shabbir Abbasi, Harith Al-Sahaf, Ian Welch

Genetic programming for electric vehicle routing problem with soft time windows

Francisco Javier Gil Gala, Marko Durasevic, Domagoj Jakobović

Optimizing LLVM Pass Sequences with Shackleton: A Linear Genetic Programming Framework

Hannah Peeler, Shuyue Li, Andrew Sloss, Kenneth Reid, Yuan Yuan, Wolfgang Banzhaf

Espresso to the rescue of Genetic Programming facing exponential complexity

Nicolas Potvin, Hugues Bersini, Dragomir Milojevic

Bayesian Model Selection for Reducing Bloat and Overfitting in Genetic Programming for Symbolic Regression

Geoffrey Bomarito, Patrick Leser, Nolan Strauss, Karl Garbrecht, Jacob Hochhalter

Using Graph Neural Networks as Surrogate Models in Genetic Programming

Martin Pilát, Gabriela Suchopárová

Going Faster and Hence Further with Lexicase Selection

Li Ding, Ryan Boldi, Thomas Helmuth, Lee Spector

Discovery of Implicit Relationships from Data Using Linear Programming and Mixed Integer Linear Programming

Quang Huynh, Hemant Singh, Tapabrata Ray

Initialisation and Grammar Design in Grammar-Guided Evolutionary Computation

Grant Dick, Peter Whigham

Phenotypic Duplication and Inversion in Cartesian Genetic Programming applied to Boolean Function Learning

Roman Kalkreuth

Environments with Local Scopes for Modules in Genetic Programming

Anil Saini, Lee Spector, Thomas Helmuth

Genetic Programming for Understanding Cognitive Biases that Generate Polarization in Social Networks

Chathika Gunaratne, Robert Patton

Neuroevolution (NE)**Accelerating Neural Architecture Exploration Across Modalities Using Genetic Algorithms**

Daniel Cummings, Sharath Sridhar, Anthony Sarah, Maciej Szankin

Towards Optimizing Neural Networks' Connectivity and Architecture Simultaneously with Feature Selection

Evgenia Papavasileiou, Jan Cornelis, Bart Jansen

Synaptic Pruning with MAP-Elites

Federico Da Rold, Olaf Witkowski, Nathanael Aubert-Kato

Novelty Driven Evolutionary Neural Architecture Search

Nilotpal Sinha, Kuan-Wen Chen

Neuroevolution of Recurrent Architectures on Control Tasks

Maximilien Le Clei, Pierre Bellec

Neuroevolution based Multi-Objective Algorithm for Gene Selection and Microarray Classification

Daniel García-Núñez, Katya Rodríguez-Vázquez, Carlos Hernández

Efficient Guided Evolution for Neural Architecture Search

Vasco Lopes, Miguel Santos, Bruno Degardin, Luís A. Alexandre

CGP-NAS: Real-based solutions encoding for multi-objective evolutionary neural architecture search

Cosijoppi Garcia-Garcia, Hugo Escalante, Alicia Morales-Reyes

The Diversity-Accuracy Duality in Ensembles of Classifiers

Rui Cardoso, Emma Hart, David Kurka, Jeremy Pitt

Neuroevolutionary Multi-objective approaches to Trajectory Prediction in Autonomous Vehicles

Fergal Stapleton, Edgar Galvan, Ganesh Sistu, Senthil Yogamani

A New Grammatical Evolution Method for Generating Deep Convolutional Neural Networks with Novel Topologies

Thiago Miranda, Diorge Sardinha, Marcio Basgalupp, Ricardo Cerri

An Effective Metaheuristic-based Pruning Method for Convolutional Neural Network

Kai-Hsun Tsai, Chun-Wei Tsai, Ming-Chao Chiang

ONE-NAS: An Online NeuroEvolution based Neural Architecture Search for Time Series Forecasting

Zimeng Lyu, Travis Desell

MFENAS: Multifactorial Evolution for Neural Architecture Search

Li Chen, Hua Xu

Real World Applications (RWA)**Minimal Criterion Artist Collective**

Kai Arulkumaran, Thu Nguyen-Phuoc

Evolving Spaceships with a Hybrid L-system Constrained Optimisation Evolutionary Algorithm

Roberto Gallotta, Kai Arulkumaran, Lisa Soros

Wind Farm Layout Optimisation using Set Based Multi-objective Bayesian Optimisation

Tinkle Chugh, Endi Ymeraj

Public Transport Timetable and Charge Optimization Using Multiple Electric Buses Types

David Peña, Bernabé Dorronsoro, Andrei Tchernykh, Patricia Ruiz

Selection schemes from evolutionary computing show promise for directed evolution of microbes

Alexander Lalejini, Emily Dolson, Anya Vostinar, Luis Zaman

Adapting Mutation and Recombination Operators to Range-Aware Relations in Real-World Application Data

Christina Plump, Bernhard Berger, Rolf Drechsler

Genetic Heterogeneity Analysis Using Genetic Algorithm and Network Science

Zhendong Sha, Yuanzhu Chen, Ting Hu

A Hybrid Optimization Tool For Active Magnetic Regenerator

Anna Ouskova Leonteva, Michel Risser, Radia Hamane, Anne Jeannin Girardon, Pierre Parrend, Pierre Collet

Multi-Objective Path Planning for Environmental Monitoring using an Autonomous Surface Vehicle

Federico Peralta, Michael Pearce, Matthias Poloczek, Daniel Gutierrez Reina, Sergio Toral, Juergen Branke

A Hyper-Heuristic Approach for Artificial Teeth Scheduling

Felix Winter, Nysret Musliu

Heuristic Strategies for Solving the Combinatorial Optimization Problem in Credit Risk Assessment: A Real-World Case Study

Yongfeng Gu, Hao Ding, Kecai Gu, Runsheng Gan, Xiaoguang Huang, Yanming Fang, Zhigang Hua, Hua Wu, Jifeng Xuan, Jun Zhou

Multi-Objective Evolutionary Beer Optimisation

Mohammad Majid al-Rifaie, Marc Cavazza

An Evolutionary Approach to the Discretization of Gene Expression Profiles to Predict the Severity of COVID-19

Nisrine Mouhrim, Alberto Tonda, Itzel Rodríguez-Guerra, Aletta Kraneveld, Alejandro Lopez Rincon

Optimizing Sample Diversity with Fairness Constraints on Imbalanced, Sparse, Hiring Data

Lauren McCarey, Thomas McTavish

A Surrogate-Assisted Multi-objective Evolutionary Algorithm for Shelter Locating and Evacuation Planning

Shi-Cheng Zha, Wei-Neng Chen, Wen-Jin Qiu, Xiao-Min Hu

An Optimization Strategy for the Complex Large-Scale Stockpile Blending Problem

Yue Xie, Aneta Neumann, Frank Neumann

On Generalizing the Power Function Exponent Constructions with Genetic Programming

Claude Carlet, Domagoj Jakobovic, Stjepan Picek

PreDive: Preserving Diversity in Test Cases for Evolving Digital Circuits using Grammatical Evolution

Krishn Gupta, Meghana Kshirsagar, Lukas Rosenbauer, Joseph Sullivan, Douglas Dias, Conor Ryan

Routing for Bridge Inspecting Robots Using a Meta-heuristic Genetic Algorithm

Bryan Dedeurwaerder, Sushil Louis, Siming Liu, Nicholas Harris

Human Activity Recognition Using Grammar-based Genetic Programming

João de Freitas, Heder Bernardino, Luciana Gonçalves, Stênio Soares

Evolving Polydisperse Soft Robotic Jamming Grippers

Seth Fitzgerald, Gary Delaney, David Howard, Frederic Maire

Facility Location Problem And Permutation Flow Shop Scheduling Problem: A Linked Optimisation Problem

Akinola Ogunsemi, John McCall, Mathias Kern, Benjamin Lacroix, David Corsar, Gilbert Owusu

Rethinking of Controller Placement Problem from Static Optimization to Multi-objective Dynamic Optimization

Sanjai Pathak, Ashish Mani, Mayank Sharma, Amlan Chatterjee

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Search-Based Software Engineering (SBSE)**Combining GIN and PMD for Code Improvements**

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Towards an Interactive Ranking Operator for NSGA-II

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A Bi-level Evolutionary Approach for the Multi-label Detection of Smelly Classes

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Theory (Theory)**Counterexample to the Best-case Running time of Efficient Non-Dominated Sorting Algorithm**

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