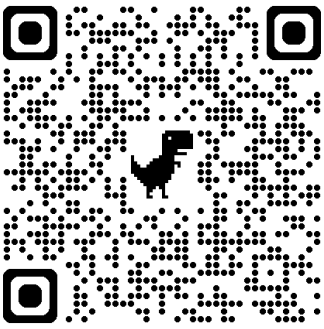

SHORT PROGRAM

# Genetic and Evolutionary Computation Conference 2025 (GECCO 2025)

Málaga, Spain, July 14–18, 2025

Please fill in the mobility survey:




Association for Computing Machinery

*Advancing Computing as a Science & Profession*


Last update: July 16, 2025

# Contents




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).

# Sponsors and Supporters

GECCO is organized and sponsored by SIGEVO, the Association for Computing Machinery Special Interest Group for Genetic and Evolutionary Computation.



GECCO 2025 gratefully acknowledges and thanks our sponsors and supporters:

## Gold Sponsors


The University of Malaga (UMA), located on Spain's Mediterranean coast, is a dynamic institution committed to excellence in teaching, research, and knowledge transfer. With a strong international focus, UMA engages in global mobility and cooperation programs, hosting over 1,900 international students annually and collaborating with more than 800 partner universities worldwide. More than 350 active research groups drive innovation and generate high-impact knowledge, reinforcing UMA's role in academic and societal advancement

https://www.uma.es/?set_language=en

## Bronze Sponsors

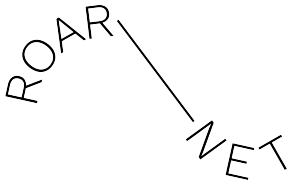

Evolutionary Computation Journal
Published by The MIT Press
https://direct.mit.edu/evco


Institute for Software Engineering and Software Technology
"José María Troya Linero"
https://itis.uma.es/en/home-2/

## Supporters

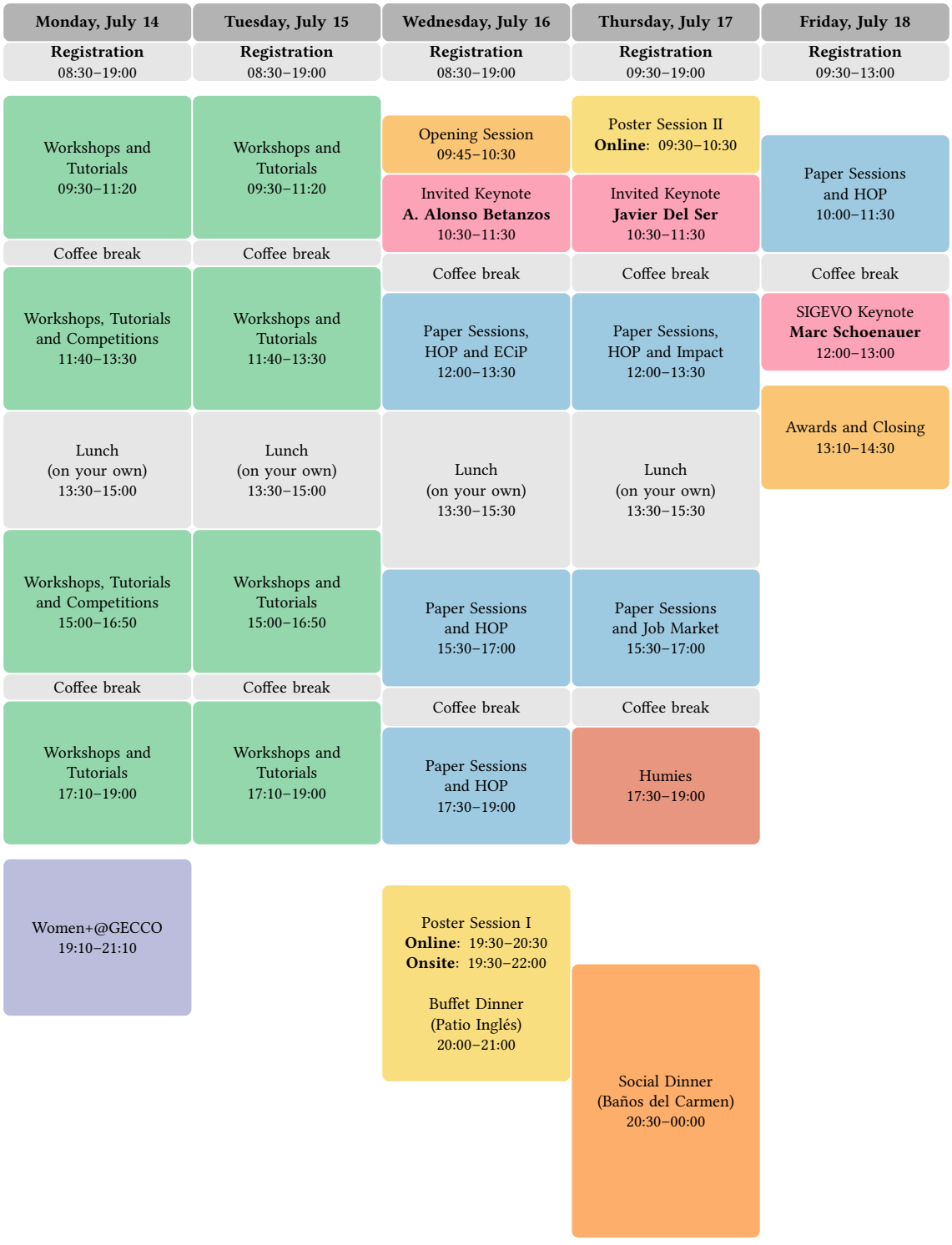


Málaga City Council
https://www.malaga.eu/




CA22137 Randomised Optimisation Algorithms Research Network (ROAR-NET)
https://roar-net.eu/

# Schedule at a Glance




- All times in this program are listed in CEST (UTC + 2 hours), Málaga's time zone during the conference.
- All sessions take place on Floor −1 (access next to reception), except those in Room Jábega (ground floor).
- Opening, Closing, Keynotes, Women+@GECCO, and Humies are in Arlequín + Tauromaquia.
- Poster Session I is in Patio Inglés.
- Both Poster Sessions include posters from tracks, late-breaking abstracts, and competitions.
- Coffee breaks are served in Patio Inglés.
- Lunch is on your own: outside food is not allowed in the hotel.

# Parallel Sessions on Monday, July 14

| | 09:30–11:20 | 11:40–13:30 | 15:00–16:50 | 17:10–19:00 |
|---|---|---|---|---|
| **Arlequín & Tauromaquia** | | Competitions | Competitions | Student Workshop |
| **Azul** | *Miikkulainen, Risi, Ha, Tang*: Evolution of Neural Networks | 10th Workshop on Industrial Applications of Metaheuristics | 10th Workshop on Industrial Applications of Metaheuristics | *Sudholt, Squillero*: Theory and Practice of Population Diversity in Evolutionary Computation |
| **Minotauro** | Open Source Software for Evolutionary Computation | Good Benchmarking Practices for Evolutionary Computation | *Ishibuchi, Pang*: Fair Performance Comparison of Evolutionary Multi-Objective Algorithms | *Pillay*: Advances in Evolutionary Hyper-Heuristics |
| **Malagueta** | *Deb, Saxena, Mittal*: Machine Learning Assisted Evolutionary Multi- and Many-objective Optimization | *Shir*: Introductory Mathematical Programming for EC | *Li*: Combinatorial Optimisation Can be Different from Continuous Optimisation for MOEAs | *Kononova, van Stein*: Structural Bias in Optimisation Algorithms |
| **Alborán** | *Vermetten, Doerr, de Nobel, Bäck*: Benchmarking Single- and Multi-Objective Optimization Algorithms: How to Make Your Experimental Data More Valuable | *Jaszkiewicz, Zielniewicz*: Recent Developments in Data Structures and Algorithms for Evolutionary Multiobjective Optimization | *Moraglio, Chicano*: Introduction to Quantum Optimization | *Machado, Correia*: Evolutionary Art and Design in the Machine Learning Era |
| **Mena** | Evolutionary Computing and Explainable AI \| Evolutionary Computation and Decision Making | 28th International Workshop on Evolutionary Rule-based Machine Learning | 28th International Workshop on Evolutionary Rule-based Machine Learning | *Whitley*: New, More Efficient Crossover and Local Search Operators for Recombination Lattices |
| **Alcazaba** | *Thierens, Bosman*: Model-Based Evolutionary Algorithms | *Cagnoni, Bi, Sun*: Evolutionary Computation and Evolutionary Deep Learning for Image Analysis, Signal Processing and Pattern Recognition | *Mei, Raidl*: Evolutionary Computation Meets Machine Learning for Combinatorial Optimization | *Couckuyt, Rojas Gonzalez, Branke*: Bayesian Optimization |
| **Gibralfaro** | *Xu, Li, Sun, Ye*: Intelligent Evolution Optimization: Guided from Deep Learning to Large Language Model | *Li*: Decomposition Multi-objective Optimization: What We Know from the Literature, and What We Are NOT Clear from a Data Science Perspective | *Doerr*: Tutorial: A Gentle Introduction to Theory (for Non-Theoreticians) | *Urbanowicz*: Automated Machine Learning Tools for Data Science, Modeling, and Algorithm Benchmarking |
| **Jábega** | *Lucas, Goodman, Tot*: Statistical Forward Planning Algorithms | | *Rothlauf*: Representations for Evolutionary Algorithms | *Đurasević, Gil Gala, Jakobović, Mei*: Genetic Programming as a Hyper-Heuristic for Solving Combinatorial Optimisation Problems |

Introductory Tutorial | Advanced Tutorial | Workshop | Competitions

# Parallel Sessions on Tuesday, July 15

| | 09:30–11:20 | 11:40–13:30 | 15:00–16:50 | 17:10–19:00 |
|---|---|---|---|---|
| Arlequín & Tauromaquia | Student Workshop | | | |
| Azul | *Cenikj, Nikolikj, Eftimov*: Recent Advances in Meta-features Used for Representing Black-box Single-objective Continuous Optimization | Workshop on Black Box Optimization Benchmarking 2025 | Workshop on Black Box Optimization Benchmarking 2025 | Neuroevolution at Work |
| Minotauro | Decomposition Techniques in Evolutionary Optimization | Graph-based Genetic Programming | Workshop on Quantum Optimization | Workshop on Quantum Optimization |
| Malagueta | Workshop on Surrogate-Assisted Evolutionary Optimisation | Workshop on Surrogate-Assisted Evolutionary Optimisation | Landscape-Aware Heuristic Search | Large Language Models for and with Evolutionary Computation Workshop |
| Alborán | *Neumann, Neumann, Singh*: Evolutionary Computation for Stochastic Problems | 15th Workshop on Evolutionary Computation for the Automated Design of Algorithms | Evolving Self-Organisation | Evolving Self-Organisation |
| Mena | Analysing Algorithmic Behaviour of Optimisation Heuristics | Evolutionary Computing and Explainable AI | Symbolic Regression Workshop | Symbolic Regression Workshop |
| Alcazaba | *Qian*: Pareto Optimization for Subset Selection: Theories and Practical Algorithms | *Beyer*: What You Always Wanted to Know About Evolution Strategies, But Never Dared to Ask | Evolutionary Generative Models | *Banzhaf, Hu*: Linear Genetic Programming |
| Gibralfaro | *XUE, Zhang*: Evolutionary Computation for Feature Selection and Feature Construction | *Toutouh, O'Reilly*: Coevolutionary Computation for Adversarial Deep Learning | *Rook, López-Ibáñez*: Advanced Use of Automatic Algorithm Configuration: Single- and Multi-Objective Approaches | *Coello Coello*: Constraint-Handling Techniques used with Evolutionary Algorithms |
| Jábega | *Kalkreuth, Cussat-Blanc, Wilson*: Cartesian Genetic Programming: From Foundations to Recent Developments and Applications | *Flageat, Lim, Templier, Cully*: Evolutionary Reinforcement Learning | | |

Introductory Tutorial
Advanced Tutorial
Specialized Tutorial
Workshop

# Parallel Sessions on Wednesday, July 16 – Friday, July 18

| | Wednesday, July 16 | | | Thursday, July 17 | | Friday, July 18 |
|---|---|---|---|---|---|---|
| | 12:00–13:30 | 15:30–17:00 | 17:30–19:00 | 12:00–13:30 | 15:30–17:00 | 10:00–11:30 |
| Arlequín & Tauromaquia | HOP 1 | HOP 2 | HOP 3 | HOP 4 | Job Market | HOP 5 |
| Azul | EML 1 | EML 2 | ECOM 2 | ECOM 3 | EML 4 | EML 5 |
| Minotauro | ★ RWA 1 | ★ EMO 1 | ★ GA 1 + SI 3 | ★ + ☆ GP 3 + Impact | ★ ECOM 4 | GP 4 |
| Malagueta | ECiP | RWA 2 | RWA 3 | RWA 4 | RWA 5 | RWA 6 |
| Alborán | GP 1 | GP 2 | EMO 2 | EMO 3 | EMO 4 | EMO 5 |
| Mena | ★ BBSR 1 + ENUM 1 | ★ GECH 1 + Theory 2 | ★ EML 3 | ★ CS 1 + NE 1 | ★ L4EC 4 | ECOM 5 |
| Alcazaba | Theory 1 | ECOM 1 | GECH 2 | GECH 3 | ENUM 2 | ENUM 3 |
| Gibralfaro | SI 1 | SI 2 | BBSR 2 | BBSR 3 | NE 2 | NE 3 |
| Jábega | L4EC 1 | L4EC 2 | L4EC 3 | GA 2 | CS 2 | CS 3 |

Paper Session

★ Session with Best Paper Nominees

Hot off the Press

Evolutionary Computation in Practice

Job Market

# Abbreviations and Symbols

## Abbreviations

| | |
|---|---|
| BBSR | Benchmarking, Benchmarks, Software, and Reproducibility |
| CS | Complex Systems |
| ECiP | Evolutionary Computation in Practice |
| 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 |
| HOP | Hot Off the Press |
| L4EC | Learning for Evolutionary Computation |
| NE | Neuroevolution |
| RWA | Real World Applications |
| SI | Swarm Intelligence |

## Symbols

☆ SIGEVO Impact Award
★ Best Paper Award nominee
✶ Best Student Workshop Paper Award nominee

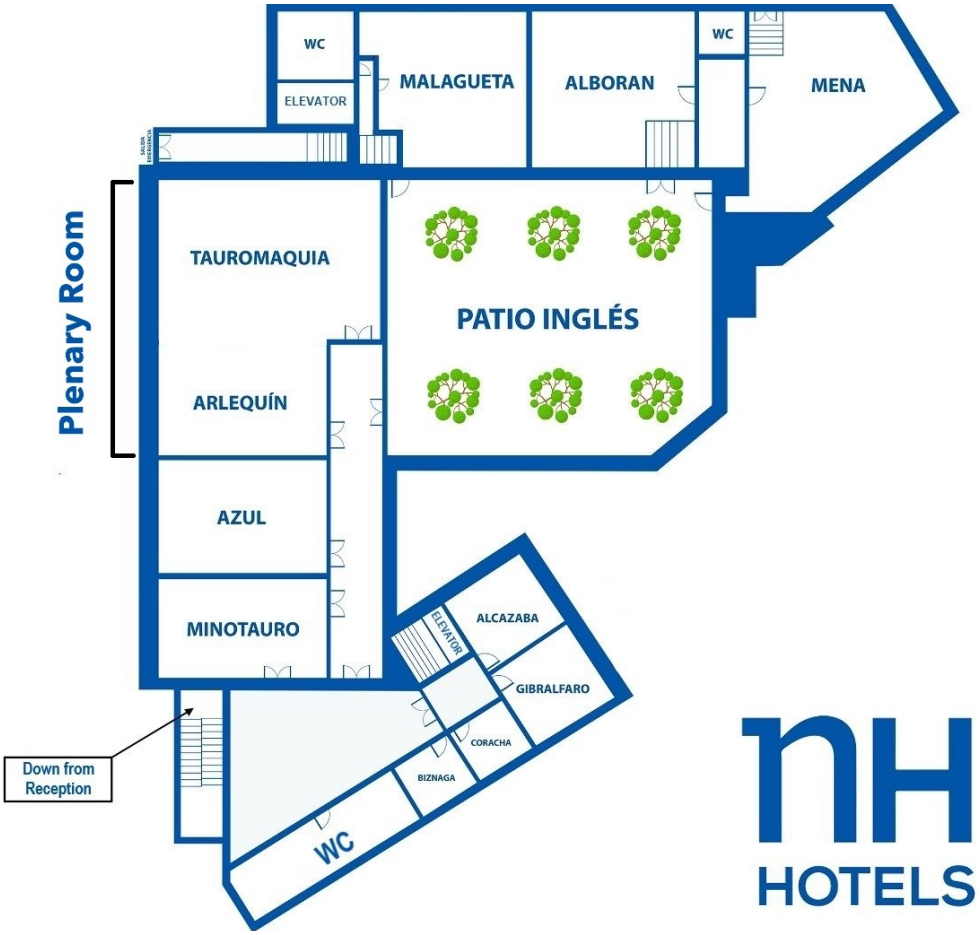
ACM Digital Library link

Onsite presentation
Online presentation
▶ Video presentation

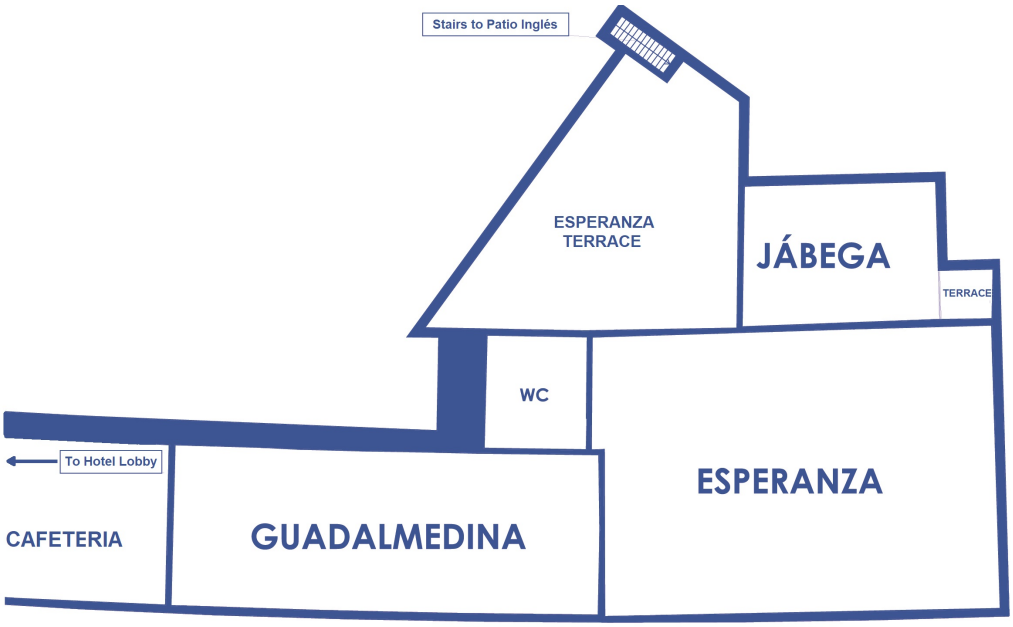
Presentation will be recorded
Presentation will not be recorded

# Floor Plans

## Floor $-1$




## Ground Floor



# Keynotes

## Wednesday, July 16 | 10:30–11:30 | Arlequín & Tauromaquia

 GECCO Keynote

### Rethinking Efficiency in Machine Learning

Chair: Gabriela Ochoa

Maria Amparo Alonso Betanzos, *CITIC-University of A Coruña, Spain*

The success of Artificial Intelligence (AI) has so far relied on developing increasingly precise models. However, this has come at the cost of greater complexity, requiring a higher number of parameters to estimate. As a result, model transparency and explainability have diminished, while the energy demands for training and deployment have skyrocketed. It is estimated that by 2030, AI could account for more than 30% of the planet's total energy consumption. In this context, green and responsible AI has emerged as a promising alternative, characterized by lower carbon footprints, reduced model sizes, decreased computational complexity, and improved transparency. Various strategies can help achieve these goals, such as improving data quality, developing more energy-efficient execution models, and optimizing energy efficiency in model training and inference. These innovation approaches highlight the potential of green AI to challenge the prevailing paradigm of ever-growing models.

## Thursday, July 17 | 10:30–11:30 | Arlequín & Tauromaquia

 GECCO Keynote

### Evolutionary Computation as a Path to Safe, Trustworthy, and Responsible General-Purpose Artificial Intelligence

Chair: Carlos Cotta

Javier Del Ser, *TECNALIA, Basque Research & Technology Alliance, and University of the Basque Country, Spain*

As AI systems grow in capability and autonomy, concerns around safety, alignment, and trust have taken center stage. Issues such as goal misalignment, vulnerability to adversarial attacks, and the inability to generalize reliably in open-world settings are no longer theoretical: they are pressing challenges with real-world implications. At the same time, global regulatory efforts, including the EU AI Act and other emerging international frameworks, are setting strict expectations for transparency, robustness, and accountability in AI development. This keynote provides an accessible introduction to the key pillars of safe, trustworthy, responsible, and general-purpose AI, tailored for newcomers to the field. It highlights how evolutionary computation offers a powerful, underexplored toolkit for meeting safety and trustworthy requirements. With its emphasis on diversity, adaptability, and robustness, evolutionary computation can contribute to safer learning, better generalization, and more resilient systems. The talk will bridge technical concepts with regulatory perspectives, illustrating how evolutionary approaches can help meet both the ethical and legal requirements driving the future of responsible AI systems.

## Friday, July 18 | 12:00–13:00 | Arlequín & Tauromaquia

sigevo Keynote

### Evolutionary Computation: Back to the Future

Chair: Peter A.N. Bosman

Marc Schoenauer, *Institut national de recherche en sciences et technologies du numérique (INRIA), France*

The evolution principles underlying Evolutionary Algorithms can be applied in any search space (i.e., to any representation), provided we are able to define meaningful variation operators with respect to the problem at hand. From the historical bitstring, continuous variables and Finite State Automata to advanced program or structure embeddings and beyond, EC has gradually, and sometimes painfully, earned its spurs, turning from confidential pocketknife to recognized Swiss Army Knife. I will try to illustrate this historical perspective with various examples gathered during my 35 (omg!) years of research in EC, and to demonstrate how a thorough exploitation of the past can provide useful hints for an efficient exploration of the future.

# Tutorials

## Monday, July 14 | 09:30–11:20

**Evolution of Neural Networks** — Azul
Risto Miikkulainen, Sebastian Risi, David Ha, Yujin Tang

**Machine Learning Assisted Evolutionary Multi- and Many-objective Optimization** — Malagueta
Kalyanmoy Deb, Dhish Kumar Saxena, Sukrit Mittal

**Benchmarking Single- and Multi-Objective Optimization Algorithms: How to Make Your Experimental Data More Valuable** — Alborán
Diederick Vermetten, Carola Doerr, Jacob de Nobel, Thomas Bäck

**Model-Based Evolutionary Algorithms** — Alcazaba
Dirk Thierens, Peter A.N. Bosman

**Intelligent Evolution Optimization: Guided from Deep Learning to Large Language Model** — Gibralfaro
Hua Xu, Xiaodong Li, Yuan Sun, Huigen Ye

**Statistical Forward Planning Algorithms** — Jábega
Simon Lucas, James Goodman, Marko Tot

## Monday, July 14 | 11:40–13:30

**Introductory Mathematical Programming for EC** — Malagueta
Ofer M. Shir

**Recent Developments in Data Structures and Algorithms for Evolutionary Multiobjective Optimization** — Alborán
Andrzej Jaszkiewicz, Piotr Zielniewicz

**Evolutionary Computation and Evolutionary Deep Learning for Image Analysis, Signal Processing and Pattern Recognition** — Alcazaba
Stefano Cagnoni, Ying Bi, Yanan Sun

**Decomposition Multi-objective Optimization: What We Know from the Literature, and What We Are NOT Clear from a Data Science Perspective** — Gibralfaro
Ke Li

## Monday, July 14 | 15:00–16:50

**Fair Performance Comparison of Evolutionary Multi-Objective Algorithms** — Minotauro
Hisao Ishibuchi, Lie Meng Pang

**Combinatorial Optimisation Can be Different from Continuous Optimisation for MOEAs** — Malagueta
Miqing Li

**Introduction to Quantum Optimization** — Alborán
Alberto Moraglio, Francisco Chicano

**Evolutionary Computation Meets Machine Learning for Combinatorial Optimization** — Alcazaba
Yi Mei, Günther R. Raidl

**Tutorial: A Gentle Introduction to Theory (for Non-Theoreticians)** — Gibralfaro
Benjamin Doerr

**Representations for Evolutionary Algorithms** — Jábega
Franz Rothlauf

## Monday, July 14 | 17:10–19:00

**Theory and Practice of Population Diversity in Evolutionary Computation** — Azul
Dirk Sudholt, Giovanni Squillero

**Advances in Evolutionary Hyper-Heuristics** — Minotauro
Nelishia Pillay

**Structural Bias in Optimisation Algorithms** — Malagueta
Anna Kononova, Niki van Stein

**Evolutionary Art and Design in the Machine Learning Era** — Alborán
Penousal Machado, João Correia

**New, More Efficient Crossover and Local Search Operators for Recombination Lattices** — Mena
Darrell Whitley

**Bayesian Optimization** — Alcazaba
Ivo Couckuyt, Sebastian Rojas Gonzalez, Juergen Branke

**Automated Machine Learning Tools for Data Science, Modeling, and Algorithm Benchmarking** — Gibralfaro
Ryan Urbanowicz

**Genetic Programming as a Hyper-Heuristic for Solving Combinatorial Optimisation Problems** — Jábega
Marko Đurasević, Francisco Javier Gil Gala, Domagoj Jakobović, Yi Mei

## Tuesday, July 15 | 09:30–11:20

**Recent Advances in Meta-features Used for Representing Black-box Single-objective Continuous Optimization** — Azul
Gjorgjina Cenikj, Ana Nikolikj, Tome Eftimov

**Evolutionary Computation for Stochastic Problems** — Alborán
Frank Neumann, Aneta Neumann, Hemant Singh

**Pareto Optimization for Subset Selection: Theories and Practical Algorithms** — Alcazaba
Chao Qian

**Evolutionary Computation for Feature Selection and Feature Construction** — Gibralfaro
Bing Xue, Mengjie Zhang

**Cartesian Genetic Programming: From Foundations to Recent Developments and Applications** — Jábega
Roman Kalkreuth, Sylvain Cussat-Blanc, Dennis Wilson

## Tuesday, July 15 | 11:40–13:30

**What You Always Wanted to Know About Evolution Strategies, But Never Dared to Ask** — Alcazaba
Hans-Georg Beyer

**Coevolutionary Computation for Adversarial Deep Learning** — Gibralfaro
Jamal Toutouh, Una-May O'Reilly

**Evolutionary Reinforcement Learning** — Jábega
Manon Flageat, Bryan Lim, Paul Templier, Antoine Cully

## Tuesday, July 15 | 15:00–16:50

**Advanced Use of Automatic Algorithm Configuration: Single- and Multi-Objective Approaches** — Gibralfaro
Jeroen Rook, Manuel López-Ibáñez

## Tuesday, July 15 | 17:10–19:00

**Linear Genetic Programming** Alcazaba
Wolfgang Banzhaf, Ting Hu

**Constraint-Handling Techniques used with Evolutionary Algorithms** Gibralfaro
Carlos A. Coello Coello

# Workshops

## Monday, July 14 | 09:30–11:20

### Evolutionary Computing and Explainable AI | Evolutionary Computation and Decision Making — Mena

09:30–09:35 **Welcome & Opening**
Workshop Organizers

09:35–09:50 **Urban Transport Decision Making: Improving Traffic Prediction with Symbolic Regression, Transfer Learning and Deep Learning**
Alina Patelli, John Rego Hamilton, Aniko Ekart

09:50–10:20 **An introduction to the preference-based and interactive EMO algorithms**
Mariano Luque

10:20–10:40 **Interactive Evolutionary Optimization of Visual Explainable AI through Gestalt Principles with Human Feedback**
Doina Bucur, Sara Miotto, Leonardo Lucio Custode, Chiara Camilla Rambaldi Migliore, Giovanni Iacca

10:40–11:00 **Interpreting Machine Learning Pipelines Produced by Evolutionary AutoML for Biochemical Property Prediction**
Alex G.C. de Sá, Gisele Lobo Pappa, Alex A. Freitas, David B. Ascher

11:00–11:05 **Closing**
Workshop Organizers

### Open Source Software for Evolutionary Computation — Minotauro

09:30–09:40 **Welcome & Opening**
Workshop Organizers

09:40–10:00 **SEvoBench: A C++ Framework For Evolutionary Single-Objective Optimization Benchmarking**
Yongkang Yang, Jian Zhao, Tengfei Yang

10:00–10:20 **logicGP – A Framework for Literal Based Classification with a Focus on Software Architecture and Open Source Implementation**
Robin Nunkesser

10:20–10:40 **pyHMS: A Python Library for Hierarchic Memetic Strategy**
Wojciech Achtelik, Hubert Guzowski, Maciej Smołka

10:40–11:00 **Design, Containerization and Performance of Distributed Evolutionary Computation**
Jan Zenisek, Florian Bachinger, Christian Haider, Florian Holzinger, Philipp Neuhauser, Erik Pitzer, Stefan Wagner, Michael Affenzeller

11:00–11:10 **Slim_gsgp: A Python Library for Non-Bloating GSGP**
Liah Rosenfeld, Davide Farinati, Diogo Rasteiro, Gloria Pietropolli, Karina Brotto Rebuli, Sara Silva, Leonardo Vanneschi

11:10–11:20 **Closing**
Workshop Organizers

## Monday, July 14 | 11:40–13:30

### Good Benchmarking Practices for Evolutionary Computation — Minotauro

11:40–12:15 **Revisiting COCO with automated benchmarking in mind**
Nikolaus Hansen

12:15–12:50 **Benchmarking through the lense of a Machine Learner and Roboticist**
Antoine Cully

12:50–13:30 **General Discussion**

### 10th Workshop on Industrial Applications of Metaheuristics — Azul

11:40–11:42 **Welcome to IAM 2025**
Silvino Fernandez

11:42–12:05 **A Hybrid Constrained Programming with Genetic Algorithm for the Job Shop Scheduling Problem**
Alessandro Lorenzi, Stefano Genetti, Chiara Camilla Rambaldi Migliore, Marco Roveri, Giovanni Iacca

12:05–12:28 **Multi-objective Optimisation of Floating Offshore Wind Farms based on a Real-World Case Study**
Pawel L. Manikowski, David J. Walker, Matthew J. Craven

12:28–12:51 **Efficient Scheduling of Transformer Neural Network Computation for Edge-AI Deployment**
David Sedlák, Jan Klhufek, Vojtech Mrazek, Zdenek Vasicek

12:51–13:04 **Memory-Assisted Genetic Algorithm for Signal Timing Optimization in Traffic Networks**
Sahar Kianian, Edward Keedwell, Aidan Bennett

13:04–13:17 **Grammatical Evolution for Temperature Prediction Models in Different Photovoltaic Technologies**
Alexander Cortés-Llanos, Lucía Serrano-Lujan, Carlos Toledo, Antonio Urbina, Jose Manuel Colmenar

13:17–13:30 **GRASP Metaheuristic for Energy-efficient Drone Coverage Path Planning**
Bárbara Cristina Fonseca de Souza, Tarcísio Barroso Marques, Jose Elias Claudio Arroyo

### 28th International Workshop on Evolutionary Rule-based Machine Learning — Mena

11:40–11:50 **Welcome & Opening**
Workshop Organizers

11:50–12:20 **Evolutionary Optimization via Rule-based Learning**
Masaya Nakata

12:20–12:45 **Dimensionality Reduction for Enabling Visual Reinforcement Learning with a Classifier System**
Connor Schönberner, Armin Mackensen, Sven Tomforde

12:45–13:05 **Evolving Modular Abstractions through Lateralized Learning in Classifier Systems**
Abubakar Siddique, Muhammad Iqbal, Will N. Browne, Gina M. Grimshaw

13:05–13:30 **Why state differentiation in ACS2 is not enough in aliased environments**
Mateusz Łabędzki, Olgierd Unold

## Monday, July 14 | 15:00–16:50

### 10th Workshop on Industrial Applications of Metaheuristics — Azul

15:00–15:23 **Evolutionary Adaptive Stress Testing for Collision Avoidance in Sustainable Maritime Transportation**
Thomas Steenfeldt Laursen, Ole Jakob Mengshoel

15:23–15:46 **Nested Multi-objective Model Updating for an Aircraft Wingtail Digital Twin**
Jake Hollins, Kostantinos Agathos, Tinkle Chugh

15:46–16:46 **Panel Discussion: Industrial Application on Metaheuristics**
Carlos Alba, Kalyanmoy Deb, Manuel Iori, Manuel López-Ibáñez, Thomas Bäck

16:46–16:50 **Conclusions**

### 28th International Workshop on Evolutionary Rule-based Machine Learning — Mena

15:00–15:20 **GPU-Accelerated Rule Evaluation and Evolution**
Hormoz Shahrzad, Risto Miikkulainen

15:20–15:40 **How to Design an LCS to Create Explainable AI Models for Real-World Applications**
Michael Heider

15:40–16:05 **A Proposal for a Leaner Narrative of Learning Classifier Systems**
Pierluca Lanzi, Daniele Loiacono

16:05–16:40 **Panel Discussion**

16:40–16:50 **Closing Remarks**

## Monday, July 14 | 17:10–19:00

### Student Workshop — Arlequín & Tauromaquia

17:10–17:15 **Welcome & Opening by the Workshop Organisers**

17:15–17:35 ✶ **The Specificity vs. Expense Trade-Off of Multiagent Credit**
Raghav Thakar, Kagan Tumer

17:35–17:55 ✶ **School Bus Routing for Pupils with Special Needs Under Uncertainty: An Averaging Approach**
Ozioma Paul, Julia Handl, Manuel López-Ibáñez

17:55–18:15 ✶ **Evaluation of Sensitivity Analysis of Penalty Weights in QUBO**
Jiajie Liu, Alberto Moraglio

18:15–18:35 ✶ **Noise Resilient Quantum Circuit Design by Multi-Objective Genetic Algorithm**
Christian Wood, Alberto Moraglio

## Tuesday, July 15 | 09:30–11:20

### Analysing Algorithmic Behaviour of Optimisation Heuristics — Mena

09:30–09:33 **Welcome**

09:33–10:18 **It is Time for a Revision of COCO BBOB**
Hans-Georg Beyer

10:18–10:38 **Tracing Genome Influence in Multi-Objective Evolutionary Algorithms**
Tobias Benecke, Sanaz Mostaghim

10:38–10:58 **Correlated Geometric Mutations for Integer Evolution Strategies**
Ofer M. Shir, Michael Emmerich

10:58–11:18 **Evolving to Extinction: a Case Study in Heuristic Search Dynamics**
James McDermott, Kostadin Dimanov Georgiev, Miguel Nicolau

11:18–11:20 **Closing**

## Decomposition Techniques in Evolutionary Optimization — Minotauro

09:30–09:55 **The Pitfalls and Potentials of Adding Gene-invariance to Optimal Mixing**
Anton Bouter, Dirk Thierens, Peter A.N. Bosman

09:55–10:20 **Towards a Penalty Annealing Approach in MOEA/D for Constrained Multi-Objective Optimization**
Miguel Ángel Jiménez-Domínguez, Néstor Andrés García-Rojas, Saúl Zapotecas-Martínez, Raquel Díaz-Hernández, Leopoldo Altamirano-Robles, Bilel Derbel

## Workshop on Surrogate-Assisted Evolutionary Optimisation — Malagueta

09:30–09:40 **Welcome Note, Workshop Introduction, and Session Overview**

09:40–10:05 **Transfer Learning of Surrogate Models: Integrating Domain Warping and Affine Transformations**
Shuaiqun Pan, Diederick Vermetten, Manuel López-Ibáñez, Thomas Bäck, Hao Wang

10:05–10:30 **Performance Benchmarking of Multi-Objective Surrogate-Assisted Evolutionary Algorithms on a Novel Computational Fluid Dynamics Test Case**
Benjamin Moore, Andrew Roberts, Daniel Jarman, Alma Rahat, Jonathan Fieldsend, Gavin Tabor

10:30–10:55 **Surrogate Model-Based Multi-Objective Optimization Using Desirability Functions**
Thomas Bartz-Beielstein

10:55–11:20 **Automated Prediction of Compressor Performance Maps: Surrogate-Based Optimization with RNNs for Enhanced Extrapolation and Interpolation**
Richard Schulz, Alexander Hinterleitner, Noah Christoph Pütz, Jens Uwe Brandt, Matthias Müller, Thomas Bartz-Beielstein

## Student Workshop — Arlequín & Tauromaquia

09:30–09:50 **Automated Generation of Trajectory-based Metaheuristics for Capacitated Vehicle Routing**
Pablo Contreras Estrada, Thomas Stützle, Leslie Pérez Cáceres

09:50–10:10 **Efficient Pretrained Model for Surrogate-assisted High-Dimensional Expensive Multi-objective Optimization**
Jiajun Li, Shuwei Zhu, Wei Fang

10:10–10:30 **LLM-aided Evolutionary Algorithms for Haiku Generation**
Vedant Jobanputra, Basam Thilaknath Reddy, Sri Ganesh Bhojanapalli, S.V.S Krishna Aditya, Bagavathi Chandrasekara, Ritwik Murali

10:30–10:50 **Towards Automated and Interpretable Decision Support Systems for Precision Livestock Farming Using Evolutionary Computing**
Elisabeth Mayrhuber, Stephan Winkler

10:50–11:10 **Efficient Waste Collection Routing Using F-CVRP and Dynamic Parameter Optimization via Q-Learning**
Yogesh Kumar, Prakhar Gupta, Karuna Panwar, Kusum Deep

11:10–11:15 **Closing by Workshop Organisers**

# Tuesday, July 15 | 11:40–13:30

## Workshop on Black Box Optimization Benchmarking 2025 — Azul

11:40–12:00 **Blackbox Optimization Benchmarking with COCO – Fundamentals and Recent Developments**
The BBOBies

12:00–12:10 **On the Robustness of BFGS to Positive and Negative Noise Outliers on the BBOB Test Suite**
Alexandre Chotard, Anne Auger

12:10–12:20 **On the Robustness of Nelder-Mead to Positive and Negative Noise Outliers with Heavy-Tails on the BBOB Test Suite**
Alexandre Chotard, Anne Auger

12:20–12:30 **Benchmarking Powell's Legacy: Performance of Five Derivative-Free Solvers in pdfo on the bbob Test Suite**
Dimo Brockhoff, Tanguy Villain

12:30–12:40 **How Robust is UOBYQA to Worsening, Frozen Noise? Investigations on the bbob Test Suite With Outliers**
Dimo Brockhoff, Tanguy Villain

12:40–13:00 **Benchmarking CMA-ES under Additive and Subtractive Noise on the BBOB Testbed**
Oskar Girardin

13:00–13:20 **Benchmarking Improved Variants of CMA-ES-PDM on the bbob-mixint Testbed**
Duc Manh Nguyen

13:20–13:30 **Session Wrap Up**
The BBOBies

## 15th Workshop on Evolutionary Computation for the Automated Design of Algorithms — Alborán

11:40–11:45 **Welcome & Opening**
Workshop Organizers

11:45–12:05 **Genetic Improvement of Dynamic Optimization Algorithms using PushGP**
Vladimir Stanovov, Eugene Semenkin

12:05–12:25 **How to Train Algorithm Selection Models: Insights from Black-box Continuous Optimization**
Xiao He, Haopu Shang, Chao Qian

12:25–12:45 **Learning the Particle Swarm Optimization Velocity Update via Genetic Programming**
Frederico J.J.B. Santos, Andrea De Lorenzo, Luca Manzoni, Gloria Pietropolli

12:45–12:50 **Keynote Introduction**

12:50–13:20 **Some few examples of automated design of algorithm**
Thomas Stützle

13:20–13:30 **Open discussion & Wrap up**
Workshop Organizers

## Evolutionary Computing and Explainable AI — Mena

11:40–11:45 **Welcome & Opening**
Workshop Organizers

11:45–12:05 **A Step towards Interpretable Multimodal AI Models with MultiFIX**
Mafalda Malafaia, Thalea Schlender, Tanja Alderliesten, Peter A.N. Bosman

12:05–12:25 **A Better Multi-Objective GP-GOMEA – But do we Need it?**
Joe Harrison, Tanja Alderliesten, Peter A.N. Bosman

12:25–12:45 **Evaluating a Novel Explainability Method for Metaheuristics via a User Study**
GianCarlo Antonino Pasquale Ignazio Catalano, Alexander Brownlee, David Cairns, John McCall, Russell Ainslie

12:45–13:05 **Local Optima Networks (LONs) and Search Trajectory Networks (STNs) for Noisy Combinatorial Problems**
John Payne, Aishwaryaprajna, David J. Walker, Edward Keedwell

13:05–13:30 **Open Discussion**

### Graph-based Genetic Programming — Minotauro

11:40–12:10 **Everybody Wants to Rule the Benchmark: The Dangers of GP Leaderboard Chasing**
Fabrício Olivetti de França

12:10–12:30 **Linear Genetic Programming for Design Graph Neural Networks for Node Classification**
Maciej Krzywda, Szymon Łukasik, Amir H. Gandomi

12:30–12:50 **Towards Efficient Semantic Mutation in CGP: Enhancing SOMOk**
Lukas Plevac, Zdenek Vasicek

12:50–13:10 **Evolving Typed Token Processing Networks**
Berfin Sakallioglu, Giorgia Nadizar, Luca Manzoni, Eric Medvet

13:10–13:30 **On Chromosome Crossover in Multimodal Adaptive Graph Evolution**
Camilo De La Torre, Sylvain Cussat-Blanc, Hervé Luga, Dennis Wilson, Yuri Lavinas

### Workshop on Surrogate-Assisted Evolutionary Optimisation — Malagueta

11:40–11:45 **Welcome Note, and Session Overview**

11:45–11:57 **From 'How Good?' to 'Is it Better?': Classification-Based Surrogate Models for JADE**
Konrad Krawczyk, Jarosław Arabas

11:57–12:09 **A Novel Mesh Deformation Methodology for Computational Aerodynamic Shape Optimisation**
Joelle Salamoun, Ben Hickling Smith, Ben Evans, Sean Walton

12:09–12:39 **Panel Discussion: Surrogate-Assisted Optimisation – Past, Present, and Future**
Jonathan Fieldsend, Richard Allmendinger, Juergen Branke, Vanessa Volz

## Tuesday, July 15 | 15:00–16:50

### Workshop on Black Box Optimization Benchmarking 2025 — Azul

15:00–15:20 **Cascading CMA-ES Instances for Generating Input-diverse Solution Batches**
Maria Laura Santoni, Christoph Dürr, Carola Doerr, Mike Preuss, Elena Raponi

15:20–15:40 **BEACON: Continuous Bi-objective Benchmark problems with Explicit Adjustable COrrelatioN control**
Samuel Tebbet, George De Ath, Tinkle Chugh

15:40–16:00 **Benchmarking Seven Multi-objective Optimization Methods from the PlatEMO Platform on the bbob-biobj Test Suite**
David Ibehej, Jakub Kudela

16:00–16:20 **Benchmarking the (1+1) Limited Memory Matrix Adaptation Evolution Strategy on the bbob-largescale Testbed**
Tobias Glasmachers

16:20–16:50 **General Discussion**
The BBOBies

## Evolutionary Generative Models — Alcazaba

15:00–15:05 **Welcome & Opening**
Workshop Organizers

15:05–15:25 **Open-Ended Evolution of Artistic Styles in Diffusion Models via Island-Based Genetic Algorithms**
Marcel Salvenmoser, Michael Affenzeller

15:25–15:45 **A Voxel Representation Based Evolutionary Data Generator of Adversarial Objects for AI Agents**
Akshay

15:45–16:05 **Three-objective evolutionary search of the latent space of Generative Adversarial Networks for human face generation**
Sergio Nesmachnow, Pedro Moreno

16:05–16:25 **Multi-population GAN Training: Analyzing Co-Evolutionary Algorithms**
Walter Casas, Jamal Toutouh

16:25–16:45 **Panel Discussion**

16:45–16:50 **Closing**
Workshop Organizers

## Evolving Self-Organisation — Alborán

15:00–15:05 **Introductory Remarks**

15:05–15:50 **Surprising Synergies of Evolution and Self-Organization**
Risto Miikkulainen

15:50–16:35 **Tutorial**
Workshop Organizers

16:35–16:50 **Morphology-Adaptive Muscle-Driven Locomotion via Attention Mechanisms**
Junior Rojas

## Landscape-Aware Heuristic Search — Malagueta

15:00–15:05 **Welcome & Opening**
Workshop Organizers

15:05–15:35 **Towards Benchmarking Multi-Objective Optimization Algorithms Based on the Basin Connectivity**
Ryosuke Ota, Likun Liu, Naoki Hamada, Takahiro Yamamoto, Shoichiro Tanaka, Daisuke Sakurai

15:35–16:05 **Visualising Adam Oscillations in Neural Network Loss Landscapes**
Henri van der Grijp, Anna Sergeevna Bosman, Katherine Mary Malan

16:05–16:35 **Algorithm Explainability for Malware Evolution with Search Trajectory Networks**
Kehinde Babaagba, Ritwik Murali, Sarah L. Thomson

## Workshop on Quantum Optimization — Minotauro

15:00–15:05 **Welcome & Opening**
Workshop Organizers

15:05–15:50 **Optimization Strategies for Variational Quantum Algorithms**
Hao Wang

15:50–16:05 **On "Solving The Travelling Salesman Problem Using A Single Qubit" vs. Quantum Genetic Optimization: Are we there?**
Hamza Baniata

16:05–16:20 **A Variational Quantum Algorithm for the Permutation Flow Shop Scheduling Problem**
Marco Baioletti, Fabrizio Fagiolo, Angelo Oddi, Riccardo Rasconi

16:20–16:35 **The Quantum Approximate Optimization Algorithm Can Require Exponential Time to Optimize Linear Functions**
Francisco Chicano, Zakaria Abdelmoiz Dahi, Gabriel Luque

16:35–16:50 **Manual vs. Automated QUBO Formulations for Flow Shop Scheduling: A Comparative Study on D-Wave and InfinityQ**
Yousra Farhani, Taha Arbaoui, Karima Benatchba

### Symbolic Regression Workshop — Mena

15:00–15:05 **Welcome & Opening**
Workshop Organizers

15:05–15:25 **SCRBenchmark: A Benchmarking Library for Shape-Constrained Regression**
Florian Bachinger, Bernhard Werth, Jan Zenisek, Christian Haider, Fabrício Olivetti de França

15:25–15:45 **A Hierarchical Multiview Symbolic Regression Method for Decoding Oceanic Metabolism**
Hernan Lira, Luis Martí, Nayat Sanchez-Pi

15:45–16:05 **Can Synthetic Data Improve Symbolic Regression Extrapolation Performance?**
Fitria Wulandari Ramlan, Colm O'Riordan, Gabriel Kronberger, James McDermott

16:05–16:25 **When Data Transformations Mislead Symbolic Regression: Deceptive Search Spaces in System Identification**
Alberto Tonda, Hengzhe Zhang, Qi Chen, Bing Xue, Mengjie Zhang, Evelyne Lutton

16:25–16:45 **On the use of Hinge Loss as a Surrogate Fitness Function with Grammatical Evolution for Parkinson's Disease Classification**
Jiajun Duan, Miguel Nicolau, Michael O'Neill

16:45–16:50 **Discussion**

## Tuesday, July 15 | 17:10–19:00

### Evolving Self-Organisation — Alborán

17:10–17:25 **A Path to Universal Neural Cellular Automata**
Gabriel Béna, Maxence Faldor, Dan Goodman, Antoine Cully

17:25–17:40 **Self-Organizing Models of Brain Wiring: Developmental Programs for Evolving Intelligence**
Jamieson Warner, Risto Miikkulainen

17:40–18:25 **Poster Session**

18:25–19:00 **Talk and Concluding Remarks**
Workshop Organizers

### Large Language Models for and with Evolutionary Computation Workshop — Malagueta

17:10–17:15 **Welcome & Opening**
Workshop Organizers

17:15–17:28 **BLADE: Benchmark suite for LLM-driven Automated Design and Evolution of iterative optimisation heuristics**
Niki van Stein, Anna Kononova, Haoran Yin, Thomas Bäck

17:28–17:41 **Regarding Context Size in LLM-Based Metaheuristic Design**
Adam Viktorin, Michal Pluháček, Jozef Kovac, Tomas Kadavy, Roman Senkerik

17:41–17:54 **LLM-Guided Evolution: An Autonomous Model Optimization for Object Detection**
YiMing Yu, Jason Paul Zutty

17:54–18:07 **Optimizing Photonic Structures with Large Language Model Driven Algorithm Discovery**
Haoran Yin, Anna Kononova, Thomas Bäck, Niki van Stein

18:07–18:20 **Giving Simulated Cells a Voice: Evolving Prompt-to-Intervention Models for Cellular Control**
Nam Le, Patrick Erickson, Zhang Yanbo, Michael Levin, Josh Bongard

18:20–18:33 **LEAR: LLM-Driven Evolution of Agent-Based Rules**
Can Gurkan, Narasimha Karthik Jwalapuram, Kevin Wang, Rudy Danda, Leif Rasmussen, John Chen, Uri Wilensky

18:33–18:58 **Panel Discussion**

18:58–19:00 **Closing**
Workshop Organizers

## Neuroevolution at Work — Azul

17:10–17:15 **Welcome & Opening**
Workshop Organizers

17:15–17:45 **Low Rank Factorizations are Indirect Encodings for Deep Neuroevolution**
Jack Garbus, Jordan Pollack

17:45–18:15 **Evaluating Encoding of Neuron Configuration and Position in Neuroevolution of Liquid State Machines**
Carlos-Alberto López-Herrera, Héctor-Gabriel Acosta-Mesa, Efrén Mezura-Montes

18:15–18:35 **Unveiling the Search Space of Simple Contrastive Graph Clustering with Cartesian Genetic Programming**
Maciej Krzywda, Yue Liu, Szymon Łukasik, Amir H. Gandomi

## Workshop on Quantum Optimization — Minotauro

17:10–17:20 **In the quest for quantum advantage in variational quantum algorithm with landscape analysis**
Xavier Bonet-Monroig

17:20–17:30 **Encoding Binary Comparison Constraints in QUBO for Quantum Annealing**
Philippe Codognet

17:30–17:45 **Steiner Traveling Salesman Problem with Quantum Annealing**
Alessia Ciacco, Francesca Guerriero, Eneko Osaba

17:45–18:00 **Lookalike Clustering for Customer Segmentation: a Comparative Study of Quantum Annealing and Classical Algorithms**
Benedetta Ferrari, Giuseppe Gnocchi, Manuel Iori, Simone Mascaro, Mirko Mucciarini, Luca Rinaldi, Gianluigi Salerno, Vittorio Tartarini, Andrea Vezzani

18:00–18:15 **Quantum Annealing for Bi-objective Weighted Portfolio Optimization in Real-world Financial Markets**
Shu-Yu Kuo, Kun-Lin Lee, Yao-Hsin Chou, Jyun-Yi Shen, Sy-Yen Kuo

18:15–18:30 **Comparative Analysis of Classical and Quantum-Inspired Solvers: A Preliminary Study on the Weighted Max-Cut Problem**
Aitor Morais, Eneko Osaba, Iker Pastor, Izaskun Oregi

18:30–19:00 **Panel Discussion**

## Symbolic Regression Workshop — Mena

17:10–17:30 **Continuous Pruning for Symbolic Regression**
Bernhard Werth, Michael Affenzeller

17:30–17:50 **Model Recovery in Symbolic Regression: Theory, Conjectures, and Open Questions**
Erik-Jan Senn

17:50–18:10 **Call for Action: towards the next generation of symbolic regression benchmark**
Guilherme S. Imai Aldeia, Hengzhe Zhang, Geoffrey Bomarito, Miles Cranmer, Alcides Fonseca, Bogdan Burlacu, William G. La Cava, Fabrício Olivetti de França

18:10–18:30 **Rewarding Model Smoothness and Simplicity via Alternating Objectives in Symbolic Regression**
Nathan Haut, Mark Kotanchek

18:30–19:00 **Panel Discussion and Closing**
Workshop Organizers

# Competitions

## Monday, July 14 | 11:40–13:30

### Competitions — Arlequín & Tauromaquia

11:40–11:55 **2025 Competition on Evolutionary Computation in the Energy Domain: Summer Finals of the Risk-based Energy Scheduling**
José Almeida, Fernando Lezaman, Joao Soares, Bruno Canizes, Filipe Sousa, Zita Vale

11:55–12:10 **Numerical Global Optimization Competition on GNBG-II generated Test Suite**
Amir H. Gandomi, Kalyanmoy Deb, Rohit Salgotra

12:10–12:25 **Competition on LLM-designed Evolutionary Algorithms**
Adam Viktorin, Roman Senkerik, Michal Pluháček, Niki van Stein, Lars Kotthoff

12:25–12:40 **Planet Wars AI Challenge**
Simon Lucas

12:40–12:55 **Benchmarking Niching Methods for Multimodal Optimization**
Ali Ahrari, Jonathan Fieldsend, Mike Preuss, Xiaodong Li, Michael G. Epitropakis

12:55–13:10 **Anytime Algorithms for Many-affine BBOB Functions**
Diederick Vermetten, Carola Doerr, Thomas Bäck, Jacob de Nobel

## Monday, July 14 | 15:00–16:50

### Competitions — Arlequín & Tauromaquia

15:00–15:15 **Evolutionary Submodular Optimisation**
Aneta Neumann, Saba Sadeghi Ahouei, Jacob de Nobel, Diederick Vermetten, Thomas Bäck, Frank Neumann

15:15–15:30 **Dynamic Stacking Optimization in Uncertain Environments**
Johannes Karder, Stefan Wagner, Sebastian Leitner

15:30–15:45 **Interpretable Control Competition**
Giorgia Nadizar, Luigi Rovito, Dennis Wilson, Eric Medvet

15:45–16:00 **Evolutionary Algorithms for the Large-scale Earth Observation Satellite Scheduling Problem**
Alex Vasegaard, Jonathan Guerra

16:00–16:15 **Automated Design Competition**
Maciej Komosinski, Konrad Miazga, Agnieszka Mensfelt

# Papers

## Wednesday, July 16 | 12:00–13:30

### EML 1 — Azul

Chair: Kalyanmoy Deb, *Michigan State University, USA*

12:00–12:20 **LAOS: Large Language Model-Driven Adaptive Operator Selection for Evolutionary Algorithms**
Yisong Zhang, Guoxing Yi

12:20–12:40 **PropNEAT – Efficient GPU-Compatible Backpropagation over NeuroEvolutionary Augmenting Topology Networks**
Michael Merry, Patricia Riddle, James Warren

12:40–13:00 **Interpretable Non-linear Survival Analysis with Evolutionary Symbolic Regression**
Luigi Rovito, Marco Virgolin

13:00–13:20 **Machine Learning-Assisted Constraint Handling Under Variable Uncertainty for Preference-based Multi-Objective Optimization**
Deepanshu Yadav, Palaniappan Ramu, Kalyanmoy Deb

### ★ RWA 1 — Minotauro

Chair: Günter Rudolph, *TU Dortmund University, Germany*

12:00–12:20 ★ **Sequence Optimization of Multispacecraft Multitarget Rendezvous Missions with a Coevolutionary Algorithm**
Yu Zhang, Yuehe Zhu, Jiacheng Zhang, Yazhong Luo

12:20–12:40 ★ **Tomographic Reconstruction with Real-time a priori Acquistion**
Muhammad Wishal Khan, Hooman Oroojeni, Bal Sanghera, Tim Blackwell, Mohammad Majid al-Rifaie

12:40–13:00 ★ **Differential Evolution for Infeasible Circumstances in Network-Assisted Full-Duplex Cell-Free Massive MIMO**
Trinh Van Chien, Bui Trong Duc, Mohammadali Mohammadi, Hien Quoc Ngo, Michail Matthaiou

### GP 1 — Alborán

Chair: Penousal Machado, *University of Coimbra, Portugal*

12:00–12:20 **Multi-Objective Genetic Programming for Imbalanced Classification with Adaptive Thresholds and a New Fitness Function**
Minghui Bai, Xiaoying Gao, Jiaxin Niu, Jianbin Ma

12:20–12:40 **How Neutrality Shapes Evolution: Simplicity Bias and Search**
Ting Hu, Wolfgang Banzhaf, Gabriela Ochoa

12:40–13:00 **A comparison of tournament and lexicase selection paradigms in regression problems: error-based fitness versus correlation fitness**
Illya Bakurov, Aidan Murphy, Charles Ofria, Wolfgang Banzhaf

13:00–13:20 **Desire-Driven Selection: An Epigenetic Experiment in Genetic Programming**
José Maria Simões, Penousal Machado, Nuno Lourenço

### ★ BBSR 1 + ENUM 1 — Mena

Chair: Tobias Glasmachers, *Ruhr-University Bochum, Germany*

12:00–12:20 ★ **Why We Should be Benchmarking Evolutionary Algorithms on Neural Network Training Tasks**
Katherine Mary Malan, Mario Andrés Muñoz

12:20–12:40 ★ **When Does Neuroevolution Outcompete Reinforcement Learning in Transfer Learning Tasks?**
Eleni Nisioti, Erwan Plantec, Milton Llera Montero, Joachim Winther Pedersen, Sebastian Risi

12:40–13:00 ★ **CatCMA with Margin: Stochastic Optimization for Continuous, Integer, and Categorical Variables**
Ryoki Hamano, Masahiro Nomura, Shota Saito, Kento Uchida, Shinichi Shirakawa

13:00–13:20 ★ **Challenges of Interaction in Optimizing Mixed Categorical-Continuous Variables**
Youhei Akimoto, Xilin Gao, Ze Kai Ng, Daiki Morinaga

## Theory 1 — Alcazaba

Chair: Christine Zarges, *Aberystwyth University, UK*

12:00–12:20 **A Royal Road Function for Permutation Spaces: an Example Where Order Crossover is Provably Essential**
Andre Opris, Sebastian Sonntag, Dirk Sudholt

12:20–12:40 **Runtime Analysis of Evolutionary Multitasking for Classical Benchmark Problems**
Johannes Lengler, Aneta Neumann, Frank Neumann

12:40–13:00 **A General Upper Bound for the Runtime of a Coevolutionary Algorithm on Impartial Combinatorial Games**
Alistair Benford, Per Kristian Lehre

13:00–13:20 **Random Gradient Hyper-heuristics Can Learn to Escape Local Optima in Multimodal Optimisation**
Yuxuan Ma, Pietro S. Oliveto, John Alasdair Warwicker

## SI 1 — Gibralfaro

Chair: Edward Keedwell, *University of Exeter, UK*

12:00–12:20 **Evolving Neural Controllers for Adaptive Visual Pattern Formation by a Swarm of Robots**
Alessia Loi, Nicolas Bredeche

12:20–12:40 **Lifelong Evolution of Swarms**
Lorenzo Leuzzi, Davide Bacciu, Sabine Hauert, Simon Jones, Andrea Cossu

12:40–13:00 **Minimalist exploration strategies for robot swarms at the edge of chaos**
Vinicius Sartorio, Luigi Feola, Vito Trianni, Jonata Tyska Carvalho

13:00–13:20 **HSEPSO: A Hierarchical Self-Evolutionary PSO Approach for UAV Path Planning**
Jie Wei, Yuhui Zhang, Wenhong Wei

## L4EC 1 — Jábega

Chair: Nadarajen Veerapen, *Université de Lille, France*

12:00–12:20 **Residual Learning Inspired Crossover Operator and Strategy Enhancements for Evolutionary Multitasking**
Ruilin Wang, Xiang Feng, Huiqun Yu, Edmund M-K Lai

12:20–12:40 **Learning Graph Configuration Spaces to Support Road Network Design Optimisation**
Michael Mittermaier, Takfarinas Saber, Goetz Botterweck

12:40–13:00 **Automatic Design of Specialized Variation Operators for the Multi-Objective Quadratic Assignment Problem**
Adrián Isaí Morales-Paredes, Julio Juárez, Jesús Guillermo Falcón-Cardona, Hugo Terashima-Marín, Carlos A. Coello Coello

13:00–13:20 **Greedy Restart Schedules: A Baseline for Dynamic Algorithm Selection on Numerical Black-box Optimization Problems**
Lennart Schäpermeier

## Wednesday, July 16 | 15:30–17:00

### EML 2 — Azul

Chair: Thomas Bäck, *Leiden University, Netherlands*

15:30–15:50 **Transformers as Surrogate Models for Genetic Programming in AutoML Tasks**
Matheus Cândido Teixeira, Gisele Lobo Pappa

15:50–16:10 **Enhancing XCS with Dual-Stream Identification for Perceptual Aliasing in Multi-Step Decision-Making**
Fumito Uwano, Will N. Browne

16:10–16:30 **Adversarial attacks to image classification systems using evolutionary algorithms**
Sergio Nesmachnow, Jamal Toutouh

16:30–16:50 **Evolving Hard Maximum Cut Instances for Quantum Approximate Optimization Algorithms**
Shuaiqun Pan, Yash J. Patel, Aneta Neumann, Frank Neumann, Thomas Bäck, Hao Wang

### ★ EMO 1 — Minotauro

Chair: Tapabrata Ray, *University of New South Wales, Australia*

15:30–15:50 **★ R2 Indicator Analysis using the Optimal Distributions of Solutions for R2 and Other Indicators**
Yang Nan, Hisao Ishibuchi, Tianye Shu, Ke Shang

15:50–16:10 **★ Exploring Phase-Specific Configuration of Interactive Evolutionary Multiobjective Optimization Methods**
Giomara Larraga, Kaisa Miettinen

### RWA 2 — Malagueta

Chair: Roman Kalkreuth, *RWTH Aachen University, Germany*

15:30–15:50 **Navigating Path-Influenced Environments using Evolutionary Multi-Objective Optimization**
Carlo Nübel, Malte Florim Speidel, Sanaz Mostaghim

15:50–16:10 **Optimization of Unequal-Area Facility Layouts for Mass-Customization Assembly Systems with AGV Material Handling**
Thomas Seidelmann, Sanaz Mostaghim

16:10–16:30 **Exploring the Expressive Space of an Articulatory Vocal Modal using Quality-Diversity Optimization with Multimodal Embeddings**
Joris Grouwels, Nicolas Jonason, Bob L. T. Sturm

16:30–16:50 **Orthogonal Genetic Algorithm for Efficient Delivery Route Planning in TSP-D**
Iyed Nasra, Hervé Camus, Ghaith Manita, Amine Dhraief, Ouajdi Korbaa

### GP 2 — Alborán

Chair: Nelishia Pillay, *University of Pretoria, South Africa*

15:30–15:50 **Evolutionary Synthesis of Probabilistic Programs**
Romina Doz, Francesca Randone, Eric Medvet, Luca Bortolussi

15:50–16:10 **Reaching Meaningful Diversity with Speciation-Novelty in Genetic Improvement for Software**
Zsolt Nemeth, Penn Faulkner Rainford, Barry Porter

16:10–16:30 **Coordinate System Extraction as the Search Driver in Test-Based Genetic Programming**
Dmytro Vitel, Kok Cheng Tan, Alessio Gaspar, Paul Wiegand

16:10–16:30 **Coordinate System Extraction as the Search Driver in Test-Based Genetic Programming**
Dmytro Vitel, Kok Cheng Tan, Alessio Gaspar, Paul Wiegand

16:30–16:50 **Analysis of Memory-Runtime Trade-offs in Caching Strategies for Genetic Programming Symbolic Regression**
Jiaming Shi, Kei Sen Fong, Mehul Motani

## ★ GECH 1 + Theory 2 — Mena

Chair: James McDermott, *University of Galway, Ireland*

15:30–15:50 **★ Augmented Decision Spaces for Stackelberg Security Games: Sparse evolution begets scalability**
Adam Żychowski, Abhishek Gupta, Yew-Soon Ong, Jacek Mańdziuk

15:50–16:10 **★ Improved Runtime Analysis of a Multi-Valued Compact Genetic Algorithm on Two Generalized OneMax Problems**
Sumit Adak, Carsten Witt

16:10–16:30 **★ Why Dominance Is Not Enough: Lessons from Practical Evolutionary Multi-Objective Algorithms**
Duc-Cuong Dang, Andre Opris, Dirk Sudholt

16:30–16:50 **Diversity-driven Cooperating Portfolio of Metaheuristic Algorithms**
Adam Żychowski, Xin Yao, Jacek Mańdziuk

## ECOM 1 — Alcazaba

Chair: Emma Hart, *Edinburgh Napier University, UK*

15:30–15:50 **Application of PBIG to the Minimum Global Domination Problem**
Salim Bouamama, Christian Blum

15:50–16:10 **A Path-Relinking-based Heuristic for the Multiobjective Subgraph Problem**
Daniela Scherer dos Santos, Kathrin Klamroth, Pedro Martins, Luís Paquete

16:10–16:30 **Pareto Front Grid Guided Multiobjective Optimization In Dynamic Pickup And Delivery Problem Considering Two-Sided Fairness**
Hung Phan Duc, Bui Trong Duc, Tam Nguyen Thi, Huynh Thi Thanh Binh

16:30–16:50 **PGU-SGP: A Pheno-Geno Unified Surrogate Genetic Programming For Real-life Container Terminal Truck Scheduling**
Leshan Tan, Chenwei Jin, Xinan Chen, Rong Qu, Ruibin Bai

## SI 2 — Gibralfaro

Chair: David J. Walker, *University of Exeter, UK*

15:30–15:50 **Learning Grouping Heuristics in Ant Colony Optimization for Combinatorial Problems**
Aseel Ismael Ali, Edward Keedwell, Ayah Helal

15:50–16:10 **Adaptive Multi-Population Dynamic Optimization for Multimodal Dynamic Function Optimization**
Shoei Fujita, Ryuki Ishizawa, Hiroyuki Sato, Keiki Takadama

16:10–16:30 **An Ensemble Ant Colony Optimization Algorithm with a Hybrid Pheromone Model for Learning Rule Lists.**
James Brookhouse, Ayah Helal, Fernando E.B. Otero

### L4EC 2 — Jábega

Chair: Anna Kononova, *Leiden University, Netherlands*

15:30–15:50 **Accurate Peak Detection in Multimodal Optimization via Approximated Landscape Learning**
Zeyuan Ma, Hongqiao Lian, Wenjie Qiu, Yue-Jiao Gong

15:50–16:10 **Instance Space Analysis for the Capacitated Vehicle Routing Problem with Mixture Discriminant Analysis**
Danielle Notice, Hamed Soleimani, Nicos G. Pavlidis, Ahmed Kheiri, Mario Andrés Muñoz

16:10–16:30 **Learning Adaptive Neighborhood Search with Dual Operator Selection for Capacitated Vehicle Routing Problem**
Xiang-Ling Chen, Yi Mei, Mengjie Zhang

16:30–16:50 **Interpretable Decision Trees to Predict Solution Fitness**
GianCarlo Antonino Pasquale Ignazio Catalano, Alexander Brownlee, David Cairns, Russell Ainslie, John McCall

## Wednesday, July 16 | 17:30–19:00

### ECOM 2 — Azul

Chair: Kehinde Babaagba, *Edinburgh Napier University, UK*

17:30–17:50 **In the Search of Optimal Tree Networks: Hardness and Heuristics**
Pavel Martynov, Maxim Buzdalov, Sergey Pankratov, Vitaliy Aksenov, Stefan Schmid

17:50–18:10 **Elitist Evolutionary Algorithm for Optimization on Sets of Points**
Takumi Matsuo, Kento Uchida, Shinichi Shirakawa

18:10–18:30 **A Learning-assisted Discrete Differential Evolution for Resource Constrained Project Scheduling**
Yun Dong, Lixin Tang, Weiyan Jia

18:30–18:50 **A Multiform Many-Objective Genetic Programming Method for Dynamic Flexible Job Shop Scheduling**
Junwei Pang, Yi Mei, Mengjie Zhang

### ★ GA 1 + SI 3 — Minotauro

Chair: Dirk Thierens, *Utrecht University, Netherlands*

17:30–17:50 ★ **Empirical Linkage Learning Provably Builds Truthful Models on Concatenated Traps and H-IFF**
Marcus Schmidbauer, Dirk Sudholt

17:50–18:10 ★ **Congestion-Aware Multi-Agent Path Planning for Pick-Up and Delivery Tasks**
Mehrdad Asadi, Ann Nowé, Javad Ghofrani

18:10–18:30 **On the Use of Matching Algorithms to Transfer Solutions for the Travelling Salesperson Problem**
Liam Wigney, Aneta Neumann, Yew-Soon Ong, Frank Neumann

18:30–18:50 **Evolutionary Multitasking for the Scenario-based Travelling Thief Problem**
Thilina Pathirage Don, Aneta Neumann, Frank Neumann

### RWA 3 — Malagueta

Chair: Roman Kalkreuth, *RWTH Aachen University, Germany*

17:30–17:50 **CLEAR: Cue Learning using Evolution for Accurate Recognition Applied to Sustainability Data Extraction**
Peter Bentley, Soo Ling Lim, Fuyuki Ishikawa

17:50–18:10 **Feature Selection Using Genetic Algorithm for Intrusion Detection on Resource-Constrained Edge Devices**
Tijana Markovic, Pontus Lidholm, Per Erik Strandberg, Miguel Leon

18:10–18:30 **Contribution of Probabilistic Structured Grammatical Evolution to efficient exploration of the search space. A case study in glucose prediction**
Jessica Mégane, Nuno Lourenço, J. Ignacio Hidalgo, Penousal Machado

18:30–18:50 **Seeking and leveraging alternative variable dependency concepts in gray-box-elusive bimodal land-use allocation problems**
Jakub Maciążek, Michal Witold Przewozniczek, Jonas Schwaab

## EMO 2 — Alborán

Chair: Dimo Brockhoff, *Inria and Ecole Polytechnique, France*

17:30–17:50 **Multi-Objective Covariance Matrix Adaptation MAP-Annealing**
Shihan Zhao, Stefanos Nikolaidis

17:50–18:10 **Reference Point Specification in Greedy Inclusion Hypervolume-based Subset Selection: A Study on Two Objectives**
Adrián Isaí Morales-Paredes, Jesús Guillermo Falcón-Cardona, Julio Juárez, Hugo Terashima-Marín, Carlos A. Coello Coello

18:10–18:30 **Multiagent Credit Assignment for Multi-Objective Coordination**
Raghav Thakar, Gaurav Dixit, Siddarth Iyer, Kagan Tumer

18:30–18:50 **Customized Exploration of Landscape Features Driving Multi-Objective Combinatorial Optimization Performance**
Ana Nikolikj, Gabriela Ochoa, Tome Eftimov

## ★ EML 3 — Mena

Chair: Ryan Urbanowicz, *Cedars-Sinai Medical Center, USA*

17:30–17:50 ★ **Evolution of Inherently Interpretable Visual Control Policies**
Camilo De La Torre, Giorgia Nadizar, Yuri Lavinas, Hervé Luga, Dennis Wilson, Sylvain Cussat-Blanc

17:50–18:10 ★ **Dynamic Influence For Coevolutionary Agents**
Everardo Gonzalez, Gaurav Dixit, Kagan Tumer

18:10–18:30 ★ **Evolutionary Quadtree Pooling for Convolutional Neural Networks**
Po-Wei Harn, Bo Hui, Libo Sun, Wei-Shinn Ku

## GECH 2 — Alcazaba

Chair: Alberto Moraglio, *University of Exeter, UK*

17:30–17:50 **Unlearning Works Better Than You Think: Local Reinforcement-Based Selection of Auxiliary Objectives**
Matthieu Lerasle, Abderrahim Bendahi, Adrien Fradin

17:50–18:10 **Code Evolution Graphs: Understanding Large Language Model Driven Design of Algorithms**
Niki van Stein, Anna Kononova, Lars Kotthoff, Thomas Bäck

18:10–18:30 **Hybrid Selection Allows Steady-State Evolutionary Algorithms to Control the Selective Pressure in Multimodal Optimisation**
Dogan Corus, Pietro S. Oliveto, Feiyang Zheng

18:30–18:50 **Key Insights into Estimating Nash Equilibria in Simultaneous Continuous Multiplayer Games Using Coevolutionary Algorithms**
Rui Leite, Hernan Aguirre, Kiyoshi Tanaka

### BBSR 2 — Gibralfaro

Chair: Vanessa Volz, *Centrum Wiskunde & Informatica, Netherlands*

17:30–17:50 **Evaluation Time Bias in Asynchronous Evolutionary Algorithms: A Replication Study and a Novel Mitigation Strategy**
Joshua Karns, Travis Desell

17:50–18:10 **Multi-objective L-shaped Test Functions**
Angus Kenny, Tapabrata Ray, Hemant Singh

18:10–18:30 **SynthACticBench: A Capability-Based Synthetic Benchmark for Algorithm Configuration**
Valentin Margraf, Anna Lappe, Marcel Wever, Carolin Benjamins, Eyke Hüllermeier, Marius Lindauer

18:30–18:50 **MILPBench: A Large-scale Benchmark Test Suite for Mixed Integer Linear Programming Problems**
Huigen Ye, Yaoyang Cheng, Hua Xu, Zhiguang Cao, Hanzhang Qin

### L4EC 3 — Jábega

Chair: Jakub Kudela, *Brno University of Technology, Czechia*

17:30–17:50 **Reinforcement Learning-Based Self-Adaptive Differential Evolution through Automated Landscape Feature Learning**
Hongshu Guo, Sijie Ma, Zechuan Huang, Yuzhi Hu, Zeyuan Ma, Xinglin Zhang, Yue-Jiao Gong

17:50–18:10 **Surrogate Learning in Meta-Black-Box Optimization: A Preliminary Study**
Zeyuan Ma, Zhiyang Huang, Jiacheng Chen, Zhiguang Cao, Yue-Jiao Gong

## Thursday, July 17 | 12:00–13:30

### ECOM 3 — Azul

Chair: Yi Mei, *Victoria University of Wellington, New Zealand*

12:00–12:20 **Smooth Transition Instance Chains in Combinatorial Optimization Problems**
Valentino Santucci, Marco Baioletti, Marco Tomassini

12:20–12:40 **Ant Colony Optimization with Policy Gradients and Replay**
William Jardee, John Sheppard

12:40–13:00 **Ant Colony Optimization for Tourist Route Planning**
Li-Ting Xu, Qiang Yang, Dan-Ting Duan, Xin Lin, Cheng-Zhi Qu, Zhen-Yu Lu, Jun Zhang

13:00–13:20 **Ant Colony Optimization Algorithm for Safest Path Computation in Presence of Correlated Failures in Backbone Networks**
Zoltán Tasnádi, Balázs Vass, Noemi Gasko

### ★ GP 3 + Impact — Minotauro

Chair: Nelishia Pillay, *University of Pretoria, South Africa*

12:00–12:20 **★ An Online Genetic Programming Approach to Dynamic Production Scheduling**
Binh Tran, Su Nguyen

12:20–12:40 **★ Quality Diversity Genetic Programming for Learning Scheduling Heuristics**
Meng Xu, Frank Neumann, Aneta Neumann, Yew-Soon Ong

12:40–13:00 **★ Transformer Semantic Genetic Programming for Symbolic Regression**
Philipp Anthes, Dominik Sobania, Franz Rothlauf

13:00–13:20 ☆ **Benchmarking program synthesis in genetic programming and beyond: reflections and future directions**
Thomas Helmuth, Lee Spector

13:20–13:40 **MAPLE: Multi-Action Programs through Linear Evolution for Continuous Multi-Action Reinforcement Learning**
Quentin Vacher, Stephen Kelly, Ali Naqvi, Nicolas Beuve, Tanya Djavaherpour, Mickaël Dardaillon, Karol Desnos

## RWA 4 — Malagueta

Chair: Roman Kalkreuth, *RWTH Aachen University, Germany*

12:00–12:20 **Symbolic Pricing Policies for Attended Home Delivery – the Case of an Online Retailer**
Miguel Lunet, Daniela Fernandes, Fábio Neves-Moreira, Pedro Amorim

12:20–12:40 **Multi-Agent Swarm Optimization for Decentralized Energy Management Considering Game Behaviors of Electric Vehicles**
Tai-You Chen, Feng-Feng Wei, Wei-Neng Chen

12:40–13:00 **Ensemble Phased Genetic Programming for Roundabout Turn Restriction Prediction**
Darren Chitty, Ayah Helal, Sareh Rowlands, Craig Willis, Christopher Underwood, Edward Keedwell

13:00–13:20 **A Dijkstra Seeded Evolutionary Multiobjective Optimization System for a Sustainable User Multimodal Transport Routing**
Guilherme Barbosa, Pedro José Pereira, Vasco Abelha, Rui Mendes, Paulo Cortez

## EMO 3 — Alborán

Chair: Hisao Ishibuchi, *Southern University of Science and Technology and Osaka Prefecture University, China*

12:00–12:20 **Variable Metric Evolution Strategies for High-dimensional Multi-Objective Optimization**
Tobias Glasmachers

12:20–12:40 **An Evolutionary Algorithm for Solving Decision Space Constrained Multi-Objective Binary Optimization Problems**
Felipe Honjo Ide, Hernan Aguirre, Kiyoshi Tanaka

12:40–13:00 **On the Pareto Set and Front of Multiobjective Spherical Functions with Convex Constraints**
Anne Auger, Dimo Brockhoff, Jordan Cork, Tea Tušar

13:00–13:20 **Scalarization-based Exploratory Landscape Analysis for Multi-Objective Continuous Optimization Problems**
Shuhei Tanaka, Shoichiro Tanaka, Toshiharu Hatanaka

## ★ CS 1 + NE 1 — Mena

Chair: Dennis Wilson, *Université de Toulouse, France*

12:00–12:20 ★ **Competition and Attraction Improve Model Fusion**
João Abrantes, Robert Tjarko Lange, Yujin Tang

12:20–12:40 ★ **Evolving Comprehensive Proxies for Zero-Shot Neural Architecture Search**
Junhao Huang, Bing Xue, Yanan Sun, Mengjie Zhang

12:40–13:00 ★ **Extract-QD Framework: A Generic Approach for Quality-Diversity in Noisy, Stochastic or Uncertain Domains**
Manon Flageat, Johann Huber, François Helenon, Stéphane Doncieux, Antoine Cully

13:00–13:20 ★ **Visualizing the Dynamics of Neuroevolution with Genetic Distance Projections**
Evan Hayden Patterson, Joshua Karns, Zimeng Lyu, Travis Desell

## GECH 3 — Alcazaba

Chair: Thomas Gabor, *LMU Munich, Germany*

12:00–12:20 **Analysing the Effectiveness of Mutation Operators for One-Sided Bipartite Crossing Minimisation**
Jakob Baumann, Ignaz Rutter, Dirk Sudholt

12:20–12:40 **Solving the Cubic Knapsack Problem using Quantum-Inspired Digital Annealer Technology**
Thiago Alves de Queiroz, Manuel Iori, Alberto Locatelli, Matthieu Parizy

12:40–13:00 **Quantum Circuit Construction and Optimization through Hybrid Evolutionary Algorithms**
Leo Sünkel, Philipp Altmann, Michael Kölle, Gerhard Stenzel, Thomas Gabor, Claudia Linnhoff-Popien

13:00–13:20 **Enhancing Quality-Diversity Optimization Through Domain-Specific Dissimilarity as Crowding Distance**
Maciej Komosinski, Agnieszka Mensfelt

13:20–13:40 **Evaluating Mutation Techniques in Genetic-Algorithm-Based Quantum Circuit Synthesis**
Michael Kölle, Tom Bintener, Maximilian Zorn, Gerhard Stenzel, Leo Sünkel, Thomas Gabor, Claudia Linnhoff-Popien

## BBSR 3 — Gibralfaro

Chair: Diederick Vermetten, *Sorbonne Université, France*

12:00–12:20 **Automated Algorithm Configuration and Systematic Benchmarking for Heterogeneous MNK-Landscapes**
Oliver Ludger Preuß, Carolin Mensendiek, Jeroen Rook, Jakob Bossek, Heike Trautmann

12:20–12:40 **rEGGression: an Interactive and Agnostic Tool for the Exploration of Symbolic Regression Models**
Fabrício Olivetti de França, Gabriel Kronberger

12:40–13:00 **Subfunction Structure Matters: A New Perspective on Local Optima Networks**
Sarah L. Thomson, Michal Witold Przewozniczek

13:00–13:20 **Evolving Diverse Differentiating Stochastic Constraints Using Multi-objective Indicators**
Saba Sadeghi Ahouei, Aneta Neumann, Frank Neumann

13:20–13:40 **RandOptGen: A Unified Random Problem Generator for Single- and Multi-Objective Optimization Problems with Mixed-Variable Input Spaces**
Moritz Vinzent Seiler, Oliver Ludger Preuß, Heike Trautmann

## GA 2 — Jábega

Chair: Francisco Chicano, *University of Málaga, Spain*

12:00–12:20 **Energy and Performance Analysis of Parallel Heterogeneous Genetic Algorithms under Various CPU and GPU DVFS Governors: A Preliminary Study on Predictive Profiling**
Amr Abdelhafez, Alexey Lastovetsky

12:20–12:40 **Evo-SINDy: Universal Discovery of Partial Differential Equations Using Cooperative Evolutionary Computation**
Yuxin Jiang, Jianyong Sun

12:40–13:00 **Gradient-Free Sparse Adversarial Attack on Object Detection Models**
Chi Cuong Le, Tri Phan, Ngoc Hoang Luong

13:00–13:20 **Dramatically Faster Partition Crossover for the Traveling Salesman Problem**
Ozeas Quevedo de Carvalho, Darrell Whitley

13:20–13:40 **How Partition Crossover Exposes Parallel Lattices and the Fractal Structure of k-Bounded Functions**
Darrell Whitley, Gabriela Ochoa, Francisco Chicano

## Thursday, July 17 | 15:30–17:00

### EML 4 — Azul

Chair: Pierluca Lanzi, *Politecnico di Milano, Italy*

15:30–15:50 **Feature selection based on cluster assumption in PU learning**
Motonobu Uchikoshi, Youhei Akimoto

15:50–16:10 **Rule-based Machine Learning: Separating Rule and Rule-Set Pareto-Optimization for Interpretable Noise-Agnostic Modeling**
Gabriel Lipschutz-Villa, Harsh Bandhey, Ruonan Yin, Malek Kamoun, Ryan Urbanowicz

16:10–16:30 **Dataset Reduction for Offline Reinforcement Learning using Genetic Algorithms with Image-Based Heuristics**
Enrique Mateos-Melero, Miguel Iglesias Alcázar, Raquel Fuentetaja, Fernando Fernández

16:30–16:50 **Genetic Algorithms for Tractable Bayesian Network Fusion via Pre-Fusion Edge Pruning**
Pablo Torrijos, José A. Gámez, José M. Puerta, Juan A. Aledo

### ★ ECOM 4 — Minotauro

Chair: Sarah L. Thomson, *Edinburgh Napier University, UK*

15:30–15:50 **★ To Repair or Not to Repair? Investigating the Importance of AB-Cycles for the State-of-the-Art TSP Heuristic EAX**
Jonathan Heins, Darrell Whitley, Pascal Kerschke

15:50–16:10 **★ On Revealing the Hidden Problem Structure in Real-World and Theoretical Problems Using Walsh Coefficient Influence**
Michal Witold Przewozniczek, Francisco Chicano, Renato Tinós, Jakub Nalepa, Bogdan Ruszczak, Agata Maria Wijata

16:10–16:30 **★ Large Neighborhood Search for Capacitated Facility Location with Customer Incompatibilities**
Ida Gjergji, Lucas Kletzander, Nysret Musliu, Andrea Schaerf

16:30–16:50 **Dynamic Temperature Control of Simulated Annealing using Hyper-Heuristics**
Francesca Da Ros, Luca Di Gaspero, Lucas Kletzander, Marie-Louise Lackner, Nysret Musliu, Andrea Schaerf

### RWA 5 — Malagueta

Chair: Fabrício Olivetti de França, *Universidade Federal do ABC, Brazil*

15:30–15:50 **Evolutionary Algorithms for Metabolic Transformation through Multi-gene Knockout Optimization**
Bruno Sá, Alexandre Oliveira, Miguel Rocha

15:50–16:10 **Search-based Generation of Waypoints for Triggering Self-Adaptations in Maritime Autonomous Vessels**
Karoline Nylænder, Aitor Arrieta, Shaukat Ali, Paolo Arcaini

16:10–16:30 **A Quality Diversity Approach to Evolving Model Rockets**
Jacob Schrum, Cody Crosby

16:30–16:50 **Unveiling the dynamics of NOx pollution in internal combustion engines by Structured Grammatical Evolution**
Marcos Llamazares López, Daniel Parra, Jose Manuel Velasco Cabo, Óscar Garnica, Rafael Jacinto Villanueva Micó, J. Ignacio Hidalgo

## EMO 4 — Alborán

Chair: Tea Tušar, *Jožef Stefan Institute, Slovenia*

15:30–15:50 **Addressing Heterogeneous Evaluation Times in Constrained Multi-Objective Optimization using a Mixed-Fidelity Evaluation Technique: Proof-of-Concept Results**
Balija Santoshkumar, Kalyanmoy Deb

15:50–16:10 **Search Behavior Analysis of NSGA-III: Dominance-based and Decomposition-based Multi-objective Evolutionary Algorithm**
Hisao Ishibuchi, Lie Meng Pang, Cheng Gong

16:10–16:30 **Analyzing the Landscape of the Indicator-based Subset Selection Problem**
Keisuke Korogi, Ryoji Tanabe

16:30–16:50 **Influence of Subpopulation on the Performance of Coevolutionary Algorithms for Constrained Multiobjective Optimization Problems**
Yanyu Chen, Hisao Ishibuchi, Yang Nan

## ★ L4EC 4 — Mena

Chair: Clarisse Dhaenens, *Université de Lille, France*

15:30–15:50 ★ **Deep reinforcement learning for instance-specific algorithm configuration**
Elias Schede, Moritz Vinzent Seiler, Kevin Tierney, Heike Trautmann

15:50–16:10 ★ **The Pitfalls of Benchmarking in Algorithm Selection: What We Are Getting Wrong**
Gašper Petelin, Gjorgjina Cenikj

16:10–16:30 ★ **On the Importance of Reward Design in Reinforcement Learning-based Dynamic Algorithm Configuration: A Case Study on OneMax with (1+($\lambda$,$\lambda$))-GA**
Tai Nguyen, Phong Le, André Biedenkapp, Carola Doerr, Nguyen Dang

## ENUM 2 — Alcazaba

Chair: Anne Auger, *Inria and Ecole Polytechnique, France*

15:30–15:50 **Toward Efficient Mixed-Integer Black-Box Optimization via Evolution Strategies with Plateau Handling Techniques**
Tuan Anh Nguyen, Ngoc Hoang Luong

15:50–16:10 **Abnormal Mutations: Evolution Strategies Don't Require Gaussianity**
Jacob de Nobel, Diederick Vermetten, Hao Wang, Anna Kononova, Günter Rudolph, Thomas Bäck

16:10–16:30 **More Efficient Real-Valued Gray-Box Optimization through Incremental Distribution Estimation in RV-GOMEA**
Renzo Scholman, Tanja Alderliesten, Peter A.N. Bosman

16:30–16:50 **A Perturbation and Speciation-Based Algorithm for Dynamic Optimization Uninformed of Change**
Federico Signorelli, Anil Yaman

## NE 2 — Gibralfaro

Chair: Bing Xue, *Victoria University of Wellington, New Zealand*

15:30–15:50 **Neuroevolution of Self-Attention Over Proto-Objects**
Rafael Coimbra Pinto, Anderson Rocha Tavares

15:50–16:10 **SiamNAS: Siamese Surrogate Model for Dominance Relation Prediction in Multi-objective Neural Architecture Search**
Yuyang Zhou, Ferrante Neri, Yew-Soon Ong, Ruibin Bai

16:10–16:30 **CPPN2WFC: Extending Wave Function Collapse to Generate Globally Coherent Content**
Oleg Jarma Montoya, František Srb, Djordje Grbic, Sebastian Risi

16:30–16:50 **Integrating Neural Architecture Search and Rematerialization for Efficient On-Device Learning**
Chih-Ling Chen, Kai-Chiang Wu, Ning-Chi Huang

### CS 2 — Jábega

Chair: Hannah Janmohamed, *Imperial College, UK*

15:30–15:50 **Overcoming Deceptiveness in Fitness Optimization with Unsupervised Quality-Diversity**
Lisa Coiffard, Paul Templier, Antoine Cully

15:50–16:10 **Controller Distillation Reduces Fragile Brain-Body Co-Adaptation and Enables Migrations in MAP-Elites**
Alican Mertan, Nick Cheney

16:10–16:30 **Dominated Novelty Search: Rethinking Local Competition in Quality-Diversity**
Ryan Bahlous-Boldi, Maxence Faldor, Luca Grillotti, Hannah Janmohamed, Lisa Coiffard, Lee Spector, Antoine Cully

16:30–16:50 **Multi-Objective Quality-Diversity in Unstructured and Unbounded Spaces**
Hannah Janmohamed, Antoine Cully

## Friday, July 18 | 10:00–11:30

### EML 5 — Azul

Chair: Franz Rothlauf, *University of Mainz, Germany*

10:00–10:20 **Guiding Evolutionary AutoEncoder Training with Activation-Based Pruning Operators**
Steven Jorgensen, Erik Hemberg, Jamal Toutouh, Una-May O'Reilly

10:20–10:40 **Black-Box Adversarial Attack on Dialogue Generation via Multi-Objective Optimization**
Khang Gia Le, Ngoc Hoang Luong

10:40–11:00 **ImageBreeder: Guiding Diffusion Models with Evolutionary Computation**
Dominik Sobania, Martin Briesch, Franz Rothlauf

### GP 4 — Minotauro

Chair: Wolfgang Bhanzaf, *Michigan State University, USA*

10:00–10:20 **Improving Genetic Programming for Symbolic Regression with Equality Graphs**
Fabrício Olivetti de França, Gabriel Kronberger

10:20–10:40 **Uniform Projection of Program Space Geometry for Genetic Improvement of Software**
Benjamin Craine, Barry Porter

10:40–11:00 **Slim_gsgp: A Python Library for Non-Bloating GSGP**
Liah Rosenfeld, Davide Farinati, Diogo Rasteiro, Gloria Pietropolli, Karina Brotto Rebuli, Sara Silva, Leonardo Vanneschi

11:00–11:20 **Program Synthesis with LLM-Predicted Minimal Specialized Grammars**
David Vella Zarb, Geoff Parks, Timoleon Kipouros

### RWA 6 — Malagueta

Chair: Alexander Brownlee, *University of Stirling, UK*

10:00–10:20 **Bayesian Optimization for CVaR-based portfolio optimization**
Robert Millar, Jinglai Li

10:20–10:40 **Optimization of Conformal Cooling Channels for Injection Molding Using Multi-Objective Artificial Intelligence Techniques**
Antonio Gaspar-Cunha, João Melo, Tomás Marques, António Pontes

10:40–11:00 **GA-PRE: A Genetic Algorithm-Based Automatic Data Preprocessing Algorithm**
Jian Jiao, Liu Yuan

## EMO 5 — Alborán

Chair: Carlos A. Coello Coello, *CINVESTAV-IPN, Mexico*

10:00–10:20 **Improved Convergence-relaxed Mechanism for Handling Imbalance Between Convergence and Diversity in the Decision Space in Multimodal Multi-objective optimization**
Zhipan Li, Wenkai Mao, Huigui Rong, Jianguo Chen, Shengxu Huo, Zilu Zhao

10:20–10:40 **Constrained Multi-objective Optimization with Search Direction Learning**
Mingcheng Zuo, Dunwei Gong, Tianyang Xue, Chunliang Zhao, Yongde Guo

10:40–11:00 **High-Dimensional Expensive Multiobjective Optimization Using a Surrogate-Assisted Multifactorial Evolutionary Algorithm**
Yuma Horaguchi, Masaya Nakata

11:00–11:20 **Genotype vs. Phenotype: A Crossover Operator Comparison for the Multi-Objective Coverage Path Planning Problem**
Lukas Bostelmann-Arp, Christoph Steup, Sanaz Mostaghim

## ECOM 5 — Mena

Chair: Yi Mei, *Victoria University of Wellington, New Zealand*

10:00–10:20 **Moving between high-quality optima using multi-satisfiability characteristics in hard-to-solve Max3Sat instances**
Jędrzej Piątek, Michal Witold Przewozniczek, Francisco Chicano, Renato Tinós

10:20–10:40 **Performance Comparison between Evolutionary Algorithms and Linear Programming-based Relaxation Methods for Multi-Objective Knapsack Problems**
Cheng Gong, Ping Guo, Lie Meng Pang, Qingfu Zhang, Hisao Ishibuchi

10:40–11:00 **Cluster Prevention in Evolutionary Diversity Optimization for Parallel Machine Scheduling**
Dominic Wittner, Jakob Bossek

11:00–11:20 **Local Optima Networks for Constrained Search Spaces**
Jonathan Fieldsend, Arnaud Liefooghe, Katherine Mary Malan, Sébastien Verel

## ENUM 3 — Alcazaba

Chair: Youhei Akimoto, *University of Tsukuba and RIKEN AIP, Japan*

10:00–10:20 **Classification-Based Linear Surrogate Modeling of Constraints for AL-CMA-ES**
Oskar Girardin, Nikolaus Hansen, Dimo Brockhoff, Anne Auger

10:20–10:40 **An Adaptive Re-evaluation Method for Evolution Strategy under Additive Noise**
Catalin-Viorel Dinu, Yash J. Patel, Xavier Bonet-Monroig, Hao Wang

10:40–11:00 **Surrogate-Assisted CMA-ES for Problems with Low Effective Dimensionality**
Yuta Sekino, Yohei Watanabe, Kento Uchida, Shinichi Shirakawa

11:00–11:20 **Adaptive Estimation of the Number of Algorithm Runs in Stochastic Optimization**
Tome Eftimov, Peter Korošec

## NE 3 — Gibralfaro

Chair: Risto Miikkulainen, *University of Texas at Austin, USA*

10:00–10:20 **A Multi-Objective Approach to Optimizing Kolmogorov-Arnold Networks**
Quan Long, Bin Wang, Bing Xue, Mengjie Zhang

10:20–10:40 **Neuro-Evolutionary Approach to Physics-Aware Symbolic Regression**
Jiří Kubalík, Robert Babuska

10:40–11:00 **Diversity in Reinforcement Learning Through the Occupancy Measure**
Arno Feiden, Jochen Garcke

11:00–11:20 **Scaling Policy Gradient Quality-Diversity with Massive Parallelization via Behavioral Variations**
Konstantinos Mitsides, Maxence Faldor, Antoine Cully

## CS 3 — Jábega

Chair: Malcolm Heywood, *Dalhousie University, Canada*

10:00–10:20 **Fertility During Learning in Evolutionary Robot Systems**
Jacopo Michele Di Matteo, Oliver Weissl, A.E. Eiben

10:20–10:40 **Classifier Systems as Linear Probability Models**
Gijs Schröder, Johannes Textor

10:40–11:00 **Emergent Braitenberg-style Behaviours for Navigating the ViZDoom 'My Way Home' Labyrinth**
Caleidgh Bayer, Robert Smith, Malcolm Heywood

# Hot off the Press

## Wednesday, July 16 | 12:00–13:30

### HOP 1

Arlequín & Tauromaquia

Chair: Bing Xue, *Victoria University of Wellington, New Zealand*

12:00–12:10 **Fitness Landscapes of Buffer Allocation Problem in Production Lines and Genetic Algorithms Performance**
Alexandre Dolgui, Anton Eremeev, Vyatcheslav Sigaev

12:10–12:20 **An Archive Can Bring Provable Speed-ups in Multi-Objective Evolutionary Algorithms**
Chao Bian, Shengjie Ren, Miqing Li, Chao Qian

12:20–12:30 **Hot off the Press: Runtime Analysis of the Compact Genetic Algorithm on the LeadingOnes Benchmark**
Marcel Chwiałkowski, Benjamin Doerr, Martin S. Krejca

12:30–12:40 **Explainable Benchmarking for Iterative Optimization Heuristics**
Niki van Stein, Diederick Vermetten, Anna Kononova, Thomas Bäck

12:40–12:50 **Hot off the Press: Speeding Up the NSGA-II With a Simple Tie-Breaking Rule**
Benjamin Doerr, Tudor Ivan, Martin S. Krejca

12:50–13:00 **New evolutionary methods for solving single- and multi-objective political redistricting problems: The context of Poland**
Michał Tomczyk, Miłosz Kadziński

13:00–13:10 **EVOTER: Evolution of Transparent Explainable Rule sets**
Hormoz Shahrzad, Babak Hodjat, Risto Miikkulainen

13:10–13:20 **Multi-Objective Bayesian Optimization with Reinforcement Learning for Edge Deployment of DNNs on Microcontrollers**
Mark Deutel, Georgios Kontes, Christopher Mutschler, Jürgen Teich

## Wednesday, July 16 | 15:30–17:00

### HOP 2

Arlequín & Tauromaquia

Chair: Sarah L. Thomson, *Napier Edinburgh University, UK*

15:30–15:40 **Knowledge-based Optimization in Epidemics Prevention**
Krzysztof Michalak

15:40–15:50 **Evolutionary Multiobjective Optimization Assisted by Scalarization Function Approximation for High-Dimensional Expensive Problems (HOP GECCO'25)**
Yuma Horaguchi, Kei Nishihara, Masaya Nakata

15:50–16:00 **Hot off the Press: Proven Runtime Guarantees for How the MOEA/D Computes the Pareto Front From the Subproblem Solutions**
Benjamin Doerr, Martin S. Krejca, Noé Weeks

16:00–16:10 **On Defining and Discovering Non-Symmetrical Dependencies**
Michal Witold Przewozniczek, Bartosz Frej, Marcin Michal Komarnicki

16:10–16:20 **Selection Methods in Genetic Programming: A Performance Analysis**
Alina Geiger, Dominik Sobania, Franz Rothlauf

16:20–16:30 **Doubly Stochastic Matrix Models and the Quadratic Assignment Problem**
Valentino Santucci, Josu Ceberio

16:30–16:40 **Hot off the Press: Finding $\epsilon$-locally Optimal Solutions for Multi-objective Multimodal Optimization**
Angel E. Rodriguez-Fernandez, Lennart Schäpermeier, Carlos Ignacio Hernández Castellanos, Pascal Kerschke, Heike Trautmann, Oliver Schütze

16:40–16:50 **Hot off the Press: Can Evolutionary Clustering Have Theoretical Guarantees?**
Chao Qian

## Wednesday, July 16 | 17:30–19:00

### HOP 3

Arlequín & Tauromaquia

Chair: Fabrício Olivetti de França, *Universidade Federal do ABC, Brazil*

17:30–17:40 **Discovering Shared Function Structures with Adaptable Parameters for Multi-Level Modeling via Symbolic Regression**
Kei Sen Fong, Mehul Motani

17:40–17:50 **Alternating between Surrogate Model Construction and Search for Configurations of an Autonomous Delivery System (Hot off the Press at GECCO 2025)**
Chin-Hsuan Sun, Thomas Laurent, Paolo Arcaini, Fuyuki Ishikawa

17:50–18:00 **Hot off the Press: Near-Tight Runtime Guarantees for Many-Objective Evolutionary Algorithms**
Simon Wietheger, Benjamin Doerr

18:00–18:10 **Hot Off the Press: A Newton Method for Hausdorff Approximations of the Pareto Front within Multi-objective Evolutionary Algorithms**
Hao Wang, Angel E. Rodriguez-Fernandez, Lourdes Uribe, André Deutz, Oziel Cortés-Piña, Oliver Schütze

18:10–18:20 **Hot off the Press: Runtime Analysis for Multi-Objective Evolutionary Algorithms in Unbounded Integer Spaces**
Benjamin Doerr, Martin S. Krejca, Günter Rudolph

18:20–18:30 **Hot off the Press: Runtime Analysis for State-of-the-Art Multi-objective Evolutionary Algorithms on the Subset Selection Problem**
Renzhong Deng, Weijie Zheng, Mingfeng Li, Jie Liu, Benjamin Doerr

18:30–18:40 **Analyzing Single-objective Black-box Optimization Algorithms Using the Empirical Attainment Function**
Manuel López-Ibáñez, Diederick Vermetten, Johann Dreo, Carola Doerr

18:40–18:50 **Hot off the Press: No Free Lunch Theorem and Black-Box Complexity Analysis for Adversarial Optimisation**
Per Kristian Lehre, Shishen Lin

## Thursday, July 17 | 12:00–13:30

### HOP 4

Arlequín & Tauromaquia

Chair: Nuno Lourenço, *University of Coimbra, Portugal*

12:00–12:10 **Maintaining Diversity Provably Helps in Evolutionary Multimodal Optimization**
Shengjie Ren, Zhijia Qiu, Chao Bian, Miqing Li, Chao Qian

12:10–12:20 **Hot Off the Press: Multi-Objectivising Acquisition Functions in Bayesian Optimisation**
Chao Jiang, Miqing Li

12:20–12:30 **LLaMEA: A Large Language Model Evolutionary Algorithm for Automatically Generating Metaheuristics**
Niki van Stein, Thomas Bäck

12:30–12:40 **Gradient-Guided Local Search for Large-Scale Hypervolume Subset Selection**
Yang Nan, Tianye Shu, Hisao Ishibuchi, Ke Shang

12:40–12:50 **Landscape Analysis for Surrogate Models in the Evolutionary Black-Box Context (Extended Abstract)**
Zbyněk Pitra, Jan Koza, Jiří Tumpach, Martin Holeňa

12:50–13:00 **Evidential Fuzzy Rule-Based Machine Learning to Quantify Classification Uncertainty**
Hiroki Shiraishi, Hisao Ishibuchi, Masaya Nakata

13:00–13:10 **Evolutionary Co-Optimization of Rule Shape and Fuzziness in Rule-Based Machine Learning**
Hiroki Shiraishi, Yohei Hayamizu, Tomonori Hashiyama, Keiki Takadama, Hisao Ishibuchi, Masaya Nakata

13:10–13:20 **Interpreting Tangled Program Graphs Under Partially Observable Dota 2 Invoker Tasks**
Robert Smith, Malcolm Heywood

## Friday, July 18 | 10:00–11:30

### HOP 5 — Arlequín & Tauromaquia

Chair: Anna Kononova, *Leiden University, Netherlands*

10:00–10:10 **Hot off the Press: Bayesian Inverse Transfer in Evolutionary Multiobjective Optimization**
Jiao Liu, Abhishek Gupta, Yew-Soon Ong

10:10–10:20 **Towards Running Time Analysis of Interactive Multi-objective Evolutionary Algorithms**
Tianhao Lu, Chao Bian, Chao Qian

10:20–10:30 **Hot off the Press: First Steps Towards a Runtime Analysis When Starting With a Good Solution**
Denis Antipov, Maxim Buzdalov, Benjamin Doerr

10:30–10:40 **A Many-Objective Problem Where Crossover is Provably Indispensable**
Andre Opris

10:40–10:50 **Finding the Set of Nearly Optimal Solutions of a Multi-objective Optimization Problem**
Oliver Schütze, Angel E. Rodriguez-Fernandez, Carlos Segura, Carlos Ignacio Hernández Castellanos

10:50–11:00 **GSGP-Hardware: FPGA implementation of GSGP**
Yazmin Maldonado, Ruben Salas, Joel A. Quevedo, Rogelio Valdez, Leonardo Trujillo

11:00–11:10 **On the Generalisation Performance of Geometric Semantic Genetic Programming for Boolean Functions: Learning Block Mutations**
Dogan Corus, Pietro S. Oliveto

11:10–11:20 **Hot off the Press: Quality-Diversity Algorithms Can Provably Be Helpful for Optimization**
Chao Qian, Ke Xue, Ren-Jian Wang

# Other Events

## Humies

### Thursday, July 17 | 17:30–19:00 | Arlequín & Tauromaquia

17:30–17:40 **A Computational Model for Multiobjective Optimization of Multipolar Stimulation in Cochlear Implants: An Enhanced Focusing Approach**
Marcos Hernández-Gil, Ángel Ramos-de-Miguel, David Greiner, Domingo Benítez, Ángel Ramos-Macías, José María Escobar

17:40–17:50 **LLaMEA: A Large Language Model Evolutionary Algorithm for Automatically Generating Metaheuristics**
**Optimizing Photonic Structures with Large Language Model Driven Algorithm Discovery**
Niki van Stein, Thomas Bäck, Haoran Yin, Anna Kononova

17:50–18:00 **Designing Hardware-Friendly Hash Functions for Network Security Using Cartesian Genetic Programming**
Mujtaba Hassan, Jo Vliegen, Stjepan Picek, Nele Mentens

18:00–18:10 **Unlocking the Potential of Global Human Expertise**
Elliot Meyerson, Olivier Francon, Darren Sargent, Babak Hodjat, Risto Miikkulainen

18:10–18:20 **AUTOSTUB: Genetic Programming-Based Stub Creation for Symbolic Execution**
Felix Mächtle, Nils Loose, Jan-Niclas Serr, Jonas Sander, Thomas Eisenbarth

18:20–18:30 **Software Product Line Engineering via Software Transplantation**
Leandro Oliveira de Souza, Eduardo Santana de Almeida, Paulo Anselmo da Mota Silveira Neto, Earl T. Barr, Justyna Petke

18:30–18:40 **Hybrid Generative AI for De Novo Design of Co-Crystals with Enhanced Tabletability**
Nina Gubina, Andrei Dmitrenko, Gleb Solovev, Lyubov Yamshchikova, Oleg Petrov, Ivan Lebedev, Nikita Serov, Grigorii Kirgizov, Nikolay Nikitin, Vladimir Vinogradov

18:40–18:50 **Video Game Procedural Content Generation Through Software Transplantation Game Software Engineering: A Controlled Experiment Comparing Automated Content Generation Techniques**
Mar Zamorano, Daniel Blasco, África Domingo, Carlos Cetina, Federica Sarro

## Evolutionary Computation in Practice (ECiP)

### Wednesday, July 16 | 12:00–13:30 | Malagueta

12:00–12:20 **Quantum (computing) needs you! Quantum (computing) wants you!**
Xavier Bonet-Monroig

12:20–12:40 **Robust Contextual Preferential Bayesian Optimization for Real-World Applications with Biased Data and Minimal Expert Involvement**
Farha A. Khan

12:40–13:00 **Application of Quantum Annealing to Optimize Parts Storage Arrangement in a Logistics Center**
Hirotaka Kaji

13:00–13:20 **On the antagonism between foundations and applications in graph-based genetic programming**
Roman Kalkreuth

## Women+@GECCO

### Monday, July 14 | 19:10–21:10 | Arlequín & Tauromaquia

## Job Market

### Thursday, July 17 | 15:30–17:00 | Arlequín & Tauromaquia

## SIGEVO Summer School