Schedule and Floor Plans
## Schedule at a Glance

<table>
<thead>
<tr>
<th>Sunday, July 15</th>
<th>Monday, July 16</th>
<th>Tuesday, July 17</th>
<th>Wednesday, July 18</th>
<th>Thursday, July 19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tutorials, Workshops, and Competitions</strong>&lt;br&gt;09:00-10:40</td>
<td>Tutorials and Workshops&lt;br&gt;09:00-10:40</td>
<td>Invited Keynote Kazuo Yano&lt;br&gt;09:10-10:20</td>
<td>Invited Keynote Tatsuya Okabe&lt;br&gt;09:10-10:20</td>
<td>Paper Sessions and HOP&lt;br&gt;09:00-10:40</td>
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<tr>
<td><strong>Coffee Break</strong></td>
<td>Coffee Break</td>
<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
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<tr>
<td><strong>Lunch on Your Own</strong>&lt;br&gt;11:00-12:40</td>
<td>Lunch on Your Own (Job Market)</td>
<td>Lunch on Your Own</td>
<td>Lunch on Your Own</td>
<td><strong>SIGEVO Meeting/Awards Closing</strong> 12:10-13:40</td>
</tr>
<tr>
<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
<td><strong>SIGEVO Summer School Closing</strong> 13:40-16:30</td>
</tr>
<tr>
<td><strong>Tutorials, Workshops, and LBA</strong>&lt;br&gt;14:00-15:40</td>
<td>Paper Sessions, ECiP and HUMIES</td>
<td>Invited Keynote Naoko Yamazaki&lt;br&gt;14:00-15:10</td>
<td>Paper Sessions and HOP&lt;br&gt;15:30-17:10</td>
<td><strong>Social Event</strong> 18:00-22:00</td>
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<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
<td><strong>Coffee Break</strong></td>
<td><strong>Social Event</strong> 18:00-22:00</td>
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<tr>
<td><strong>Welcome Party</strong>&lt;br&gt;17:45-20:00</td>
<td><strong>Women @ GECCO</strong>&lt;br&gt;18:00-20:00</td>
<td><strong>Poster Session</strong>&lt;br&gt;18:00-20:00</td>
<td><strong>Social Event</strong>&lt;br&gt;18:00-22:00</td>
<td><strong>Social Event</strong> 18:00-22:00</td>
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</tbody>
</table>
Registration desk hours: 9:00-16:00 (closed during lunch)

Coffee breaks: Foyer of Terrsa Hall (1F and 2F)

Keynotes, job market, poster session, and SIGEVO meeting: Terrsa Hall (1F)

Summer School lunch meetings: Sunday, July 15 and Monday, July 16 – Study Room

Student Workshop lunch meeting: Monday, July 16 – Conference Room No. 9

GPEM meeting: Tuesday, July 17 – Conference Room No. 9

ECJ meeting: Wednesday, July 18 – Conference Room No. 9

Welcome party: Terrsa Hall (1F)

Social event: GECCO 2018 banquet will be held at Shunju Hall, in Rihga Royal Hotel Kyoto, on Wednesday, July 18. Rihga Royal Hotel Kyoto (http://www.rihgaroyalkyoto.com/) is located on the west side of Kyoto Station, at about a 15 minutes walk from the conference venue.
## Workshop and Tutorial Sessions, Sunday, July 15

<table>
<thead>
<tr>
<th>Time</th>
<th>Terra Hall (1F)</th>
<th>Training Room 1 (2F)</th>
<th>Training Room 2 (2F)</th>
<th>Training Room 3 (2F)</th>
<th>Conference Room Medium (2F)</th>
<th>AV Study Room (2F)</th>
<th>Conference Room A (3F)</th>
<th>Conference Room B (3F)</th>
<th>Conference Room C (3F)</th>
<th>Conference Room D (3F)</th>
<th>Conference Room 2 (3F)</th>
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**Legend:**
- **Tutorials**
- **Workshops**
- **Competitions**
## Workshop and Tutorial Sessions, Monday, July 16

<table>
<thead>
<tr>
<th>Time</th>
<th>Schedule</th>
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<tbody>
<tr>
<td>09:00-10:40</td>
<td>Terrsa Hall (1F) Model-Based Evolutionary Algorithms, Thierens, Bosman</td>
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<tr>
<td></td>
<td>Training Room 1 (2F) SecDef — Genetic and Evolutionary Computation in Defense, Security and Risk Management, Thierens, Bosman</td>
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<td>Training Room 2 (2F) BB-DOB — Black Box Discrete Optimization Benchmarking, Thierens, Bosman</td>
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<td>Training Room 3 (2F) CMA-ES and Advanced Adaptation Mechanisms, Akimoto, Hansen</td>
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<tr>
<td>11:00-12:40</td>
<td>Terrsa Hall (1F) Evolutionary Multiobjective Optimization, Brockhoff</td>
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<td>Training Room 1 (2F) NSBECR — New Standards for Benchmarking in Evolutionary Computation Research, Thierens, Bosman</td>
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<td>Training Room 2 (2F) IML/ECADA — Industrial Application / Automated Design of Algorithms, Thierens, Bosman</td>
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<tr>
<td></td>
<td>Training Room 3 (2F) IAM/ECADA — Industrial Application / Automated Design of Algorithms, Thierens, Bosman</td>
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<td>14:00-15:40</td>
<td>Terrsa Hall (1F) Decomposition Multiobjective Optimisation, Thierens, Bosman</td>
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<td>Training Room 1 (2F) PDEIM — Parallel and Distributed Evolutionary Inspired Methods, Thierens, Bosman</td>
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<tr>
<td>16:00-17:40</td>
<td>Terrsa Hall (1F) Visualization in Multiobjective Optimisation, Thierens, Bosman</td>
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<td>Training Room 1 (2F) Automation Offline Design of Algorithms, Thierens, Bosman</td>
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</tbody>
</table>

### Workshops

- **Model-Based Evolutionary Algorithms**: Thierens, Bosman (Terrsa Hall, 1F)
- **Training Room 1 (2F)**: SecDef — Genetic and Evolutionary Computation in Defense, Security and Risk Management
- **Training Room 2 (2F)**: BB-DOB — Black Box Discrete Optimization Benchmarking
- **Training Room 3 (2F)**: CMA-ES and Advanced Adaptation Mechanisms, Akimoto, Hansen (Conference Room Medium, 2F)

### Tutorials

- **Bio-Inspired Approaches to Anomaly and Intrusion Detection**: Marti, Schoenauer (AV Study Room, 2F)
- **IWLCS — Learning Classifier Systems**: Smith (Conference Room C, 3F)

### Conference Sessions

- **Conference Room A (3F)**: Promoting Diversity in Evolutionary Optimization: Why and How Squillero, Tonda
- **Conference Room B (3F)**: Student Workshop
- **Conference Room C (3F)**: Medical Applications of Evolutionary Computation, Smith (Conference Room C, 3F)
- **Conference Room D (3F)**: Evolutionary Computation: A Unified Approach, De Jong
- **Conference Room 2 (3F)**: Theory of Estimation-of-Distribution Algorithms, Witt

### Lecture Notes

- **Model-Based Evolutionary Algorithms**: Thierens, Bosman (Terrsa Hall, 1F)
- **SecDef — Genetic and Evolutionary Computation in Defense, Security and Risk Management**: Thierens, Bosman (Training Room 1, 2F)
- **BB-DOB — Black Box Discrete Optimization Benchmarking**: Thierens, Bosman (Training Room 2, 2F)
- **CMA-ES and Advanced Adaptation Mechanisms**: Akimoto, Hansen (Training Room 3, 2F)
- **Bio-Inspired Approaches to Anomaly and Intrusion Detection**: Marti, Schoenauer (AV Study Room, 2F)
- **IML/ECADA — Industrial Application / Automated Design of Algorithms**: Thierens, Bosman (Conference Room Medium, 2F)
- **Promoting Diversity in Evolutionary Optimization: Why and How**: Squillero, Tonda (Conference Room B, 3F)
- **Medical Applications of Evolutionary Computation**: Smith (Conference Room C, 3F)
- **Evolutionary Computation: A Unified Approach**: De Jong (Conference Room D, 3F)
- **Theory of Estimation-of-Distribution Algorithms**: Witt (Conference Room 2, 3F)

### Late-Breaking Abstracts

- **SecDef — Genetic and Evolutionary Computation in Defense, Security and Risk Management**
- **BB-DOB — Black Box Discrete Optimization Benchmarking**
- **CMA-ES and Advanced Adaptation Mechanisms**: Akimoto, Hansen (Conference Room Medium, 2F)
- **Bio-Inspired Approaches to Anomaly and Intrusion Detection**: Marti, Schoenauer (AV Study Room, 2F)
- **IWLCS — Learning Classifier Systems**: Smith (Conference Room C, 3F)
- **Promoting Diversity in Evolutionary Optimization: Why and How**: Squillero, Tonda (Conference Room B, 3F)
- **Medical Applications of Evolutionary Computation**: Smith (Conference Room C, 3F)
- **Evolutionary Computation: A Unified Approach**: De Jong (Conference Room D, 3F)
- **Theory of Estimation-of-Distribution Algorithms**: Witt (Conference Room 2, 3F)
# Parallel Sessions, Tuesday, July 17 through Thursday, July 19

<table>
<thead>
<tr>
<th>Time</th>
<th>Tuesday July 17</th>
<th>Tuesday July 17</th>
<th>Tuesday July 17</th>
<th>Wednesday July 18</th>
<th>Wednesday July 18</th>
<th>Thursday July 19</th>
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<tbody>
<tr>
<td>10:40-12:20</td>
<td>EML1</td>
<td>Venue Poster</td>
<td>Authors Poster</td>
<td>ECOM4</td>
<td>GA4</td>
<td>EMO7</td>
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<tr>
<td>14:00-15:40</td>
<td>ENUM1</td>
<td>HUMIES</td>
<td>ENUM2</td>
<td>ENUM3</td>
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<tr>
<td>16:00-17:40</td>
<td>GECH1</td>
<td>EML2</td>
<td>EML3</td>
<td>EML4</td>
<td>EML5</td>
<td>EML6</td>
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<tr>
<td>10:40-12:20</td>
<td>RWA1</td>
<td>GECH2</td>
<td>RWA3</td>
<td>RWA4</td>
<td>RWA5</td>
<td>RWA6</td>
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<tr>
<td>15:30-17:10</td>
<td>DETA1</td>
<td>RWA2</td>
<td>CS2</td>
<td>GP3</td>
<td>DETA2 + THEORY3</td>
<td>ENUM4</td>
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<tr>
<td>09:00-10:40</td>
<td>CS1</td>
<td>GP1</td>
<td>GP2</td>
<td>CS3</td>
<td>CS4</td>
<td>RWA7</td>
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<td></td>
<td>THEORY1</td>
<td>THEORY2</td>
<td>GECH3</td>
<td>SBSE1</td>
<td>SBSE2</td>
<td>THEORY4</td>
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<td></td>
<td>GA1</td>
<td>ACO-S11</td>
<td>GA2</td>
<td>GA3</td>
<td>ACO-S12</td>
<td>EML7</td>
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<td>ECIp1</td>
<td>ECIp2</td>
<td>ECIp3</td>
<td>HOP1</td>
<td>HOP2</td>
<td>HOP3</td>
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<td></td>
<td>EMO1</td>
<td>EMO2</td>
<td>EMO3</td>
<td>EMO4</td>
<td>EMO6</td>
<td>HOP4</td>
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<tr>
<td></td>
<td>ECOM1</td>
<td>ECOM2</td>
<td>ECOM3</td>
<td>EMO5</td>
<td>ECOM5</td>
<td>DETA3</td>
</tr>
</tbody>
</table>

- **Legend**
  - Sessions with best paper nominees
  - HUMIES
  - ECIp
  - HOP

- **Floor Plans**
  - Terrsa Hall (1F)
  - Training Room 1 (2F)
  - Training Room 2 (2F)
  - Training Room 3 (2F)
  - Conference Room Medium (2F)
  - AV Study Room (2F)
  - Conference Room A (3F)
  - Conference Room B (3F)
  - Conference Room C (3F)
  - Conference Room D (3F)
  - Conference Room 2 (3F)
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)  
**DETA:** Digital Entertainment Technologies and Arts  
**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  
**HUMIES:** Annual “Humies” Awards For Human-Competitive Results  
**HOP:** Hot Off the Press  
**RWA:** Real World Applications  
**SBSE:** Search-Based Software Engineering  
**THEORY:** Theory
Tutorials
Introductory Tutorials

**Shift Your Research & Laboratory into Higher Gear with 3 Shift Skills & 4 Smooth Rules**
David E. Goldberg, ThreeJoy Associates, Inc.
Sunday, July 15, 09:30-11:10
Terrsa Hall (1F)

**Runtime Analysis of Evolutionary Algorithms: Basic Introduction**
Per Kristian Lehre, University of Birmingham
Pietro S. Oliveto, University of Sheffield
Sunday, July 15, 09:30-11:10
Training Room 2 (2F)

**Introducing Learning Classifier Systems: Rules that Capture Complexity**
Ryan Urbanowicz, University of Pennsylvania
Danilo Vargas, Kyushu University
Sunday, July 15, 09:30-11:10
Conference Room Medium (2F)

**Introduction to Genetic Programming**
Una-May O’Reilly, MIT
Sunday, July 15, 09:30-11:10
Conference Room D (3F)

**Introductory Mathematical Programming for EC**
Ofer M. Shir, Tel-Hai College
Sunday, July 15, 09:30-11:10
Conference Room 2 (3F)

**Evolution of Neural Networks**
Risto Miikkulainen, The University of Texas at Austin
Sunday, July 15, 12:50-14:30
Terrsa Hall (1F)

**Evolutionary Computation and Games**
Julian Togelius, IT University of Copenhagen
Sebastian Risi, IT University of Copenhagen
Georgios N. Yannakakis, University of Malta
Sunday, July 15, 12:50-14:30
Training Room 2 (2F)

**Search-Maps: Visualising and Exploiting the Global Structure of Computational Search Spaces**
Gabriela Ochoa, University of Stirling
Nadarajen Veerapen, University of Stirling
Sunday, July 15, 12:50-14:30
Conference Room B (3F)

**Representations for Evolutionary Algorithms**
Franz Rothlauf, Universität Mainz
Sunday, July 15, 12:50-14:30
Conference Room D (3F)

**Introductory Statistics for EC: A Visual Approach**
Mark Wineberg, University of Guelph
Sunday, July 15, 12:50-14:30
Conference Room 2 (3F)

**Neuroevolution for Deep Reinforcement Learning Problems**
David Ha, Google Brain
Sunday, July 15, 14:50-16:30
Terrsa Hall (1F)

**Hyper-heuristics**
John R. Woodward, Queen Mary University of London
Daniel R. Tauritz, Missouri University of Science and Technology
Sunday, July 15, 14:50-16:30
Training Room 2 (2F)

**A Practical Guide to Experimentation**
Nikolaus Hansen, Inria
Sunday, July 15, 14:50-16:30
Conference Room Medium (2F)

**Search-based Test Optimization for Software Systems**
Shaukat Ali, Simula Research Laboratory
Sunday, July 15, 14:50-16:30
AV Study Room (2F)

**Theory for Non-Theoreticians**
Benjamin Doerr, Ecole Polytechnique
Sunday, July 15, 14:50-16:30
Conference Room 2 (3F)

**Model-Based Evolutionary Algorithms**
Dirk Thierens, Utrecht University
Peter A.N. Bosman, Centrum Wiskunde & Informatica (CWI)
Monday, July 16, 09:00-10:40
Terrsa Hall (1F)
<table>
<thead>
<tr>
<th>Tutorials</th>
<th>Date and Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Evolutionary Computation: A Unified Approach</strong></td>
<td>Monday, July 16, 09:00-10:40</td>
<td>Conference Room D (3F)</td>
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<tr>
<td>Kenneth De Jong, <em>Krasnow Institute</em></td>
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<tr>
<td><strong>Evolutionary Multiobjective Optimization</strong></td>
<td>Monday, July 16, 11:00-12:40</td>
<td>Terrsa Hall (1F)</td>
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<tr>
<td>Dimo Brockhoff, <em>Inria</em></td>
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<tr>
<td><strong>Advanced Tutorials</strong></td>
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<tr>
<td><strong>Evolutionary Reinforcement Learning: General Models and Adaptation</strong></td>
<td>Sunday, July 15, 12:50-14:30</td>
<td>Conference Room Medium (2F)</td>
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<tr>
<td>Danilo Vasconcellos Vargas, <em>Kyushu University</em></td>
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<td><strong>Next Generation Genetic Algorithms</strong></td>
<td>Sunday, July 15, 12:50-14:30</td>
<td>AV Study Room (2F)</td>
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<tr>
<td>Darrell D. Whitley, <em>Colorado State University</em></td>
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<td><strong>CMA-ES and Advanced Adaptation Mechanisms</strong></td>
<td>Monday, July 16, 09:00-10:40</td>
<td>Conference Room Medium (2F)</td>
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<tr>
<td>Youhei Akimoto, <em>University of Tsukuba</em></td>
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<td>Nikolaus Hansen, <em>Inria</em></td>
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<tr>
<td><strong>Promoting Diversity in Evolutionary Optimization: Why and How</strong></td>
<td>Monday, July 16, 09:00-10:40</td>
<td>Conference Room B (3F)</td>
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<tr>
<td>Giovanni Squillero, <em>Politecnico di Torino</em></td>
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<td>Alberto Tonda, <em>INRA</em></td>
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<tr>
<td><strong>Particle Swarm Optimization: A Guide to Effective, Misconception Free,</strong></td>
<td>Monday, July 16, 11:00-12:40</td>
<td>Conference Room Medium (2F)</td>
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<td><strong>Real World Use</strong></td>
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<td>Andries Engelbrecht, <em>University of Pretoria</em></td>
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<td>Christopher Wesley Cleghorn, <em>University of Pretoria</em></td>
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<td><strong>Evolutionary Computation for Digital Art</strong></td>
<td>Monday, July 16, 11:00-12:40</td>
<td>AV Study Room (2F)</td>
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<tr>
<td>Aneta Neumann, <em>The University of Adelaide</em></td>
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<td>Frank Neumann, <em>The University of Adelaide</em></td>
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<td><strong>Simulation Optimization</strong></td>
<td>Monday, July 16, 11:00-12:40</td>
<td>Conference Room D (3F)</td>
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<tr>
<td>Juergen Branke, <em>University of Warwick</em></td>
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<tr>
<td><strong>Sequential Experimentation by Evolutionary Algorithms</strong></td>
<td>Monday, July 16, 11:00-12:40</td>
<td>Conference Room 2 (3F)</td>
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<tr>
<td>Ofer M. Shir, <em>Tel-Hai College</em></td>
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<td>Thomas Bäck, <em>Leiden University</em></td>
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<tr>
<td><strong>Decomposition Multi-Objective Optimisation: Current Developments and</strong></td>
<td>Monday, July 16, 14:00-15:40</td>
<td>Terrsa Hall (1F)</td>
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<tr>
<td><strong>Future Opportunities</strong></td>
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<tr>
<td>Ke Li, <em>University of Exeter</em></td>
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<td>Qingfu Zhang, <em>City University of Hong Kong</em></td>
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<td><strong>Dynamic Parameter Choices in Evolutionary Computation</strong></td>
<td>Monday, July 16, 14:00-15:40</td>
<td>Conference Room Medium (2F)</td>
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<tr>
<td>Carola Doerr, <em>CNRS and Sorbonne University</em></td>
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<tr>
<td><strong>Constraint-Handling Techniques used with Evolutionary Algorithms</strong></td>
<td>Monday, July 16, 14:00-15:40</td>
<td>Conference Room 2 (3F)</td>
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<tr>
<td>Carlos A. Coello Coello, <em>CINVESTAV-IPN</em></td>
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<tr>
<td><strong>Visualization in Multiobjective Optimization</strong></td>
<td>Monday, July 16, 16:00-17:40</td>
<td>Terrsa Hall (1F)</td>
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<tr>
<td>Bogdan Filipic, <em>Jozef Stefan Institute</em></td>
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<td>Tea Tusar, <em>Jozef Stefan Institute</em></td>
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<tr>
<td><strong>Expressive Genetic Programming: Concepts and Applications</strong></td>
<td>Monday, July 16, 16:00-17:40</td>
<td>AV Study Room (2F)</td>
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<tr>
<td>Lee Spector, <em>Hampshire College</em></td>
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<tr>
<td>Nicholas Freitag McPhee, <em>University of Minnesota, Morris</em></td>
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Solving Complex Problems with Coevolutionary Algorithms  
Krzysztof Krawiec, Poznan University of Technology  
Malcolm Heywood, Dalhousie University

**Specialized Tutorials**

**Evolutionary Robotics**  
Stephane Doncieux, Université Pierre et Marie Curie  
Nicolas Bredeche, Université Pierre et Marie Curie  
Jean-Baptiste Mouret, Inria

**Bio-Inspired Approaches to Anomaly and Intrusion Detection**  
Luis Martí, Universidade Federal Fluminense  
Marc Schoenauer, Inria

**Medical Applications of Evolutionary Computation**  
Stephen L. Smith, University of York

**Theory of Estimation-of-Distribution Algorithms**  
Carsten Witt, Technical University of Denmark

**Cloudy Distributed Evolutionary Computation**  
JJ Merelo, University of Granada

**Evolutionary Computation for Feature Selection and Feature Construction**  
Bing Xue, Victoria University of Wellington  
Mengjie Zhang, Victoria University of Wellington

**Automated Offline Design of Algorithms**  
Manuel López-Ibáñez, University of Manchester  
Thomas Stützle, IRIDIA, Université Libre de Bruxelles

**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
Workshops, Late Breaking Abstracts, and Women@GECCO
BBOB — Black Box Optimization Benchmarking

Organizers: Anne Auger (INRIA; CMAP, Ecole Polytechnique); Julien Bect (CentraleSupélec); Dimo Brockhoff (INRIA Saclay - Ile-de-France; CMAP, Ecole Polytechnique); Nikolaus Hansen (Inria, research centre Saclay); Rodolphe Le Riche (Ecole Nationale Supérieure des Mines de Saint-Étienne); Victor Picheny (INRA); Tea Tusar (Jozef Stefan Institute)

Time and Location: Sunday, July 15, 09:30-11:10, Training Room 1 (2F)

Benchmarking the PSA-CMA-ES on the BBOB Noiseless Testbed
Kouhei Nishida, Youhei Akimoto

Benchmarking a Variant of the CMAES-APOP on the BBOB Noiseless Testbed
Duc Manh Nguyen

Stopping Criteria, Initialization, and Implementations of BFGS and their Effect on the BBOB Test Suite
Aurore Blelly, Matheus Felipe-Gomes, Anne Auger, Dimo Brockhoff

Comparing Black-Box Differential Evolution and Classic Differential Evolution
Aljosa Vodopija, Tea Tusar, Bogdan Filipic

EABDMCP — Evolutionary Algorithms for Big Data and Massively Complex Problems

Organizers: David Camacho (Universidad Autonoma de Madrid); Pedro Castillo (UGR); Francisco Chávez (University of Extremadura); Antonio J. Fernández Leiva (University of Málaga); JJ Merelo (University of Granada)

Time and Location: Sunday, July 15, 09:30-11:10, Conference Room A (3F)

Multi-objective Feature Selection for EEG Classification with Multi-Level Parallelism on Heterogeneous CPU-GPU Clusters
Juan José Escobar, Julio Ortega, Antonio Francisco Díaz, Jesús González, Miguel Damas

Mapping evolutionary algorithms to a reactive, stateless architecture
JJ Merelo, José-Mario García Valdez

IOMES — Intelligent Operations Management in the Energy Sector

Organizers: Luis Martí (Universidade Federal Fluminense); John McCall (Smart Data Technologies Centre); Nayat Sanchez-Pi (Rio de Janeiro State University (UERJ))

Time and Location: Sunday, July 15, 09:30-11:10, Conference Room C (3F)

Multiobjective Evolutionary Polygonal Approximation for Identifying Crude Oil Reservoirs
José Luis Guererro, Luis Martí, Nayat Sanchez-Pi, Antonio Berlanga, José Manuel Molina

Crude Oil Refinery Scheduling: Addressing a Real-World Multiobjective Problem through Genetic Programming and Dominance-based Approaches
Cristiane Salgado Pereira, Douglas Mota Dias, Marley Rebuzzi Vellasco, Francisco Henrique F. Viana, Luis Martí

Towards Bundling Minimal Trees in Polygonal Maps
Victor Parque, Tomoyuki Miyashita
VizGEC/SAEOpt — Visualisation Methods in Genetic and Evolutionary Computation / Surrogate-Assisted Evolutionary Optimisation

**Organizers:** Richard Everson (University of Exeter); Jonathan Edward Fieldsend (University of Exeter); Yaochu Jin (University of Surrey); Alma A. M. Rahat (University of Exeter); David Walker (University of Exeter); Handing Wang (University of Surrey)

**Time and Location:** Sunday, July 15, 09:30-11:10, Training Room 3 (2F)

VINE: An Open Source Interactive Data Visualization Tool for Neuroevolution
Rui Wang, Jeff Clune, Kenneth O. Stanley

Visualizing the tape of life: exploring evolutionary history with virtual reality
Emily L. Dolson, Charles Ofria

Visualising the Search Process for Multi-objective Optimisation
Marde Helbig

Evaluating Surrogate Models for Multi-Objective Influence Maximization in Social Networks
Doina Bucur, Giovanni Iacca, Andrea Marcelli, Giovanni Squillero, Alberto Tonda

Asynchronous Surrogate-assisted Optimization Networks
Johannes Karder, Andreas Beham, Bernhard Werth, Stefan Wagner, Michael Affenzeller

EiC — Evolution in Cognition

**Organizers:** Joshua Auerbach (Champlain College); Harold de Vladar (Konrad Lorenz Institute, Centre for Parmenides Foundation); Stéphane Doncieux (Sorbonne Université; CNRS, ISIR); Richard Duro (Universidade da Coruña)

**Time and Location:** Sunday, July 15, 12:50-14:30, Conference Room A (3F)

Invited Talk
Kenji Doya

Invited Talk
Joel Lehman

Invited Talk
Stephane Doncieux

Meta Learning by the Baldwin Effect
Chrisantha Fernando, Jakub Sygnowski, Simon Osindero, Jane Wang, Tom Schaul, Denis Teplyashin, Pablo Sprechmann, Alexander Pritzel, Andrei Rusu

The Flouted Naming Game: Contentions and Conventions in Culture
Harold P. de Vladar
RWACMO — Real-world Applications of Continuous and Mixed-integer Optimization

Organizers: Kazuhsa Chiba (The University of Electro-Communications); Akira Oyama (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency; Japan Aerospace Exploration Agency); Pramudita Palar (Tohoku University); Koji Shimoyama (Tohoku University); Hemant Kumar Singh (University of New South Wales at Australian Defence Force Academy (UNSW@ADFA), Canberra ACT, Australia)

Time and Location: Sunday, July 15, 12:50-14:30, Training Room 1 (2F)

Invited Talk: Algorithms for Optimization Under Budget Constraints, with Application Examples
Thomas Bäck

Invited Talk: Memetic and Bayesian Perspectives on Transfer Optimization: From Algorithms to Applications
Abhishek Gupta

Well Placement Optimization for Carbon dioxide Capture and Storage via CMA-ES with Mixed Integer Support
Atsuhiro Miyagi, Hajime Yamamoto, Youhei Akimoto

On Vehicle Surrogate Learning with Genetic Programming Ensembles
Victor Parque, Tomoyuki Miyashita

ECHNS — Evolutionary Computation in Health Care and Nursing System

Organizers: Koichi Nakayama (Saga University); Chika Oshima (Saga University)

Time and Location: Sunday, July 15, 12:50-16:30, Conference Room C (3F)

Can evolutionary computing be applied to dementia care?
Taro Sugihara

Sustainable Sensor Network Architecture for Monitoring Human Activities
Ren Ohmura

CATARO: A Robot that Tells Caregivers a Patient’s Current Non-Critical Condition Indirectly
Patrick Hock, Chika Oshima, Koichi Nakayama

Classifier Generalization for Comprehensive Classifiers Subsumption in XCS
Caili Zhang, Takato Tatsumi, Hiroyuki Sato, Tim Kovacs, Keiki Takadama

Framework for planning the training sessions in triathlon
Iztok Fister, Janez Brest, Andres Iglesias, Iztok Jr. Fister

Development of an Evaluation System for Upper Limb Function Using AR Technology
Yunan He, Ikushi Sawada, Osamu Fukuda, Ryusei Shima, Nobuhiko Yamaguchi, Hiroshi Okumura

Envy based Fairness in Hedonic Games
Suguru Ueda
EvoSoft — Evolutionary Computation Software Systems

Organizers: Michael Affenzeller (Upper Austrian University of Applied Sciences; Institute for Formal Models and Verification, Johannes Kepler University Linz); Stefan Wagner (University of Applied Sciences Upper Austria, Johannes Kepler University)

Time and Location: Sunday, July 15, 12:50-16:30, Training Room 3 (2F)

Performance Assessment of Multi-Objective Evolutionary Algorithms With the R Package ecr
Jakob Bossek

Performance improvements of evolutionary algorithms in Perl 6
JJ Merelo, José-Mario García Valdez

A Generic Distributed Microservices and Container based Framework for Metaheuristic Optimization
Hatem Khalloof, Wilfried Jakob, Jianlei Liu, Eric Braun, Shadi Shahoud, Clemens Duepmeier, Veit Hagenmeyer

Evo-ROS: Integrating Evolution and the Robot Operating System
Glen A. Simon, Jared M. Moore, Anthony J. Clark, Philip K. McKinley

Review: A Web-Based Simulation Viewer for Sharing Evolutionary Robotics Results
Anthony J. Clark, Jared M. Moore

Plushi: An Embeddable, Language Agnostic, Push Interpreter
Edward R. Pantridge, Lee Spector

EIEHSCoEvo — Exploration of Inaccessible Environments through Hardware/Software Co-evolution

Organizers: Gerd Ascheid (RWTH Aachen); Peter Baltus (Eindhoven University of Technology); Ahmed Hallawa (RWTH Aachen); Giovanni Iacca (University of Trento); Anil Yaman (Eindhoven University of Technology)

Time and Location: Sunday, July 15, 14:50-16:30, Conference Room A (3F)

Invited Talk: Evolutionary Robotics and Collective Behaviours: From Understanding Nature to Designing Robot Swarms
Nicolas Bredeche

Evolving Hardware Instinctive Behaviors in Resource-scarce Agent Swarms Exploring Hard-to-reach Environments
Martin Andraud, Ahmed Hallawa, Jaro De Roosa, Eugenio Cantatore, Gerd Ascheid, Marian Verhelst

A Distributed Epigenetic Shape Formation and Regeneration Algorithm for a Swarm of Robots
Rahul Shivnarayan Mishra, Tushar Semwal, Shivashankar B. Nair

LAHS — Landscape-Aware Heuristic Search

Organizers: Arnaud Liefooghe (Univ. Lille, Inria Lille - Nord Europe); Gabriela Ochoa (University of Stirling); Nadarajen Veerapen (University of Stirling); Sebastien Verel (Université du Littoral Côte d’Opale)

Time and Location: Sunday, July 15, 14:50-16:30, Conference Room B (3F)

Progressive Gradient Walk for Neural Network Fitness Landscape Analysis
Anna Sergeevna Bosman, Andries Engelbrecht, Marde Helbig
Computationally Efficient Local Optima Network Construction
Jonathan E. Fieldsend

Filter versus Wrapper Feature Selection based on Problem Landscape Features
Werner Mostert, Katherine Malan, Andries Engelbrecht

GBEA — Game-Benchmark for Evolutionary Algorithms
Organizers: Pascal Kerschke (University of Münster); Boris Naujoks (TH Köln - University of Applied Sciences); Tea Tusar (Jožef Stefan Institute); Vanessa Volz (TU Dortmund University)

Time and Location: Sunday, July 15, 14:50-16:30, Training Room 1 (2F)

Short presentation of a new benchmarking suite from game-based problems. Then, extensive discussions on what characteristics benchmarking problems should have and which ones are typical for games.

IAM/ECADA — Industrial Application of Metaheuristics / Evolutionary Computation for the Automated Design of Algorithms
Organizers: Silvino Fernandez Alzueta (ArcelorMittal); Manuel López-Ibáñez (Decision and Cognitive Sciences Research Centre, University of Manchester); Thomas Stützle (Université Libre de Bruxelles); Daniel R. Tauritz (Missouri University of Science and Technology); Pablo Valledor (ArcelorMittal); John Woodward (Queen Mary, University of London)

Time and Location: Monday, July 16, 09:00-12:40, Training Room 3 (2F)

Invited Talk: Optimization when the Evaluation Budget is very Limited: Algorithms and Applications
Thomas Bäck

Generating Interpretable Fuzzy Controllers using Particle Swarm Optimization and Genetic Programming
Daniel Hein, Steffen Udluft, Thomas A. Runkler

The Automated Design of Probabilistic Selection Methods for Evolutionary Algorithms
Samuel N. Richter, Daniel R. Tauritz

Invited Talk: Lifelong Learning Methods in Heuristic Optimisation for Continual Problem Solving
Emma Hart

BB-DOB — Black Box Discrete Optimization Benchmarking
Organizers: Pietro S. Oliveto (The University of Sheffield); Markus Wagner (School of Computer Science, The University of Adelaide); Thomas Weise (University of Science and Technology of China (USTC), School of Computer Science and Technology); Borys Wrobel (Adam Mickiewicz University); Ales Zamuda (University of Maribor)

Time and Location: Monday, July 16, 09:00-12:40, Training Room 3 (2F)

Compiling a Benchmarking Test-Suite for Combinatorial Black-Box Optimization: A Position Paper
Ofer M. Shir, Carola Doerr, Thomas Bäck

Discrete Real-world Problems in a Black-box Optimization Benchmark
Workshops, Late Breaking Abstracts, and Women@GECCO

Sebastian Raggl, Andreas Beham, Viktoria Hauder, Stefan Wagner, Michael Affenzeller

Difficult Features of Combinatorial Optimization Problems and the Tunable W-Model Benchmark Problem for Simulating them
Thomas Weise, Zijun Wu

A Generic Problem Instance Generator for Discrete Optimization Problems
Markus Ullrich, Thomas Weise, Abhishek Awasthi, Jörg Lässig

Parameterization of State-of-the-Art Performance Indicators: A Robustness Study Based on Inexact TSP Solvers
Pascal Kerschke, Jakob Bossek, Heike Trautmann

A Black-Box Discrete Optimization Benchmarking (BB-DOB) Pipeline Survey: Taxonomy, Evaluation, and Ranking
Ales Zamuda, Christine Zarges, Miguel Nicolau

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

Organizers: Riyad Alshammari (King Saud bin Abdulaziz University for Health Sciences); Tokunbo Makanju (KDDI Research)

Time and Location: Monday, July 16, 09:00-12:40, Training Room 2 (2F)

Invited Talk: GA-Based User Identity Management
Dipankar Dasgupta

Machine Learning – Based Detection of Water Contamination in Water Distribution Systems
Hadi Mohammed, Ibrahim Abdul Hameed, Razak Seidu

Using Evolutionary Dynamic Optimization for Monitor Selection in Highly Dynamic Communication Infrastructures
Robin Mueller-Bady, Martin Kappes, Francisco Palomo-Lozano, Inmaculada Medina-Bulo

A Genetic Algorithm for Dynamic Controller Placement in Software Defined Networking
Samuel Champagne, Tokunbo Makanju, Chengchao Yao, Nur Zincir-Heywood, Malcolm Heywood

Genetic Algorithms for Role Mining in Critical Infrastructure Data Spaces
Igor Saenko, Igor Kotenko

Adversarial Co-evolution of Attack and Defense in a Segmented Computer Network Environment
Erik Hemberg, Joseph R. Zipkin, Richard W. Skowyra, Neal Wagner, Una-May O’Reilly

Real-Time Strategy Game Micro for Tactical Training Simulations
Sushil J. Louis, Siming Liu, Tianyi Jiang

Automated Design of Network Security Metrics
Aaron Scott Pope, Robert Morning, Daniel R. Tauritz, Alexander Kent

Evolution of Network Enumeration Strategies in Emulated Computer Networks
Sean Harris, Eric Michalak, Kevin Schoonover, Adam Gausmann, Hannah Reinbolt, Joshua Herman, Daniel R. Tauritz, Chris Rawlings, Aaron Scott Pope
**MedGEC — Medical Applications of Genetic and Evolutionary Computation**

**Organizers:** Stefano Cagnoni (University of Parma, Italy); Robert M. Patton (Oak Ridge National Laboratory); Stephen L. Smith (University of York)

**Time and Location:** Monday, July 16, 11:00-12:40, Conference Room A (3F)

- **Design of HIFU Treatment Plans using an Evolutionary Strategy**  
  Marta Cudova, Bradley E. Treeby, Jiri Jaros
- **Coevolving Behavior and Morphology of Simple Agents that Model Small-scale Robots**  
  Milen Georgiev, Ivan Tanev, Katsunori Shimohara
- **Solution Exploration using Multi-Objective Genetic Algorithm for Determining Experiment Candidate**  
  Lorenzo Perino, Akihiro Fujii, Tsuyoshi Waku, Akira Kobayashi, Satoru Hiwa, Tomoyuki Hiroyasu

**IWLCS — Learning Classifier Systems**

**Organizers:** Masaya Nakata (Yokohama National University); Anthony Stein (University of Augsburg); Danilo Vasconcellos Vargas (Kyushu University)

**Time and Location:** Monday, July 16, 11:00-17:40, Conference Room C (3F)

- **Generalizing Rules by Random Forest-based Learning Classifier Systems for High-Dimensional Data Mining**  
  Fumito Uwano, Koji Dobashi, Keiki Takadama, Tim Kovacs
- **Applying Accuracy-based LCS to Detecting Anomalous Database Access**  
  Suin Seo, Sung-Bae Cho
- **Invited Talk: How Learning Classifier Systems Can Conquer Important Modern AI Problems**  
  Will Neil Browne
- **EvoNN - A Customizable Evolutionary Neural Network with Heterogenous Activation Functions**  
  Boris Shabash, Kay Wiese
- **XCSR Based on Compressed Input by Deep Neural Network for High Dimensional Data**  
  Kazuma Matsumoto, Ryo Takano, Takato Tatsumi, Hiroyuki Sato, Tim Kovacs, Keiki Takadama
- **Optimizing clustering to promote data diversity when generating an ensemble classifier**  
  Zohaib Muhammad Jan, Brijesh Verma, Sam Fletcher
- **An Algebraic Description of XCS**  
  David Pätzl, Jörg Hähner
- **Modulated Clustering Using Integrated Rough Sets and Scatter Search Attribute Reduction**  
  Abdel-Rahman Hedar, Abdel-Monem Ibrahim, Alaa Abdel-Hakim, Adel Sewisy
- **XCS-CR: Determining Accuracy of Classifier by its Collective Reward in Action Set toward Environment with Action Noise**  
  Takato Tatsumi, Tim Kovacs, Keiki Takadama
- **Model Parameter Adaptive Instance-Based Policy Optimization for Episodic Control Tasks of Nonholonomic Systems**  
  Kyotaro Ohashi, Natsuki Fujiyoshi, Naoki Sakamoto, Youhei Akimoto
- **Integrating Anticipatory Classifier Systems with OpenAI Gym**  
  Norbert Kozłowski, Olgierd Unold
**EAPU — Evolutionary Algorithms for Problems with Uncertainty**

**Organizers:** Ozgur Akman (University of Exeter); Khulood Alyahya (Exeter University); Juergen Branke (University of Warwick); Kevin Doherty (University of Exeter); Jonathan Edward Fieldsend (University of Exeter)

**Time and Location:** Monday, July 16, 14:00-15:40, Conference Room A (3F)

Exploration of the Effect of Uncertainty in Homogeneous and Heterogeneous Multi-agent Societies With Regard to their Average Characteristics
Milen Georgiev, Ivan Tanev, Katsunori Shimohara

A Framework for High-Dimensional Robust Evolutionary Multi-Objective Optimization
Wei Du, Le Tong, Yang Tang

Robust Multi-Modal Optimisation
Khulood Alyahya, Kevin Doherty, Ozgur E. Akman, Jonathan E. Fieldsend

Invited Talk: Enhancing Evolutionary Optimization in Uncertain Environments by Allocating Evaluations via Multi-armed Bandit Algorithms
Xin Qiu, Risto Miikkulainen

Andries Engelbrecht

**NSBECR — New Standards for Benchmarking in Evolutionary Computation Research**

**Organizers:** William LaCava (University of Massachusetts Amherst); Randal S. Olson (University of Pennsylvania); Patryk Orzechowski (University of Pennsylvania); Ryan Urbanowicz (University of Pennsylvania)

**Time and Location:** Monday, July 16, 14:00-15:40, Training Room 1 (2F)

Analysing Symbolic Regression Benchmarks under a Meta-Learning Approach
Luiz Otavio Vilas Boas Oliveira, Joao Francisco Barreto da Silva Martins, Luis Fernando Miranda, Gisele Lobo Pappa

The Impact of Statistics for Benchmarking in Evolutionary Computation Research
Tome Eftimov, Peter Korošec

Maze Benchmark for Testing Evolutionary Algorithms
Camilo Alejandro Alaguna Córdoba, Jonatan Gómez Perdomo

Evolving Benchmark Functions Using Kruskal-Wallis Test
Yang Lou, Shiu Yin Yuen, Guanrong Ron Chen

**GI — Genetic Improvement**

**Organizers:** Brad Alexander (University of Adelaide); Saemundur Haraldsson (University of Stirling); Markus Wagner (School of Computer Science, The University of Adelaide); John Woodward (Queen Mary, University of London); Shin Yoo (Korea Advanced Institute of Science and Technology)

**Time and Location:** Monday, July 16, 14:00-17:40, Training Room 3 (2F)

Invited Talk: Quantum Genetic Programming
David R. White
Synthesizing Customized Network Protocols using Genetic Programming
Mohammad Roohitavaf, Ling Zhu, Sandeep Kulkarni, Subir Biswas

Towards Modular Large-Scale Darwinian Software Improvement
Michael Orlov

Novelty Search for software improvement of a SLAM system
Víctor R. López-López, Leonardo Trujillo, Pierrick Legrand

Genetic Configuration Sampling: Learning a Sampling Strategy for Fault Detection of Configurable Systems
Jifeng Xuan, Yongfeng Gu, Zhilei Ren, Xiangyang Jia, Qingna Fan

Assessing Single-Objective Performance Convergence and Time Complexity for Refactoring Detection
David Nader-Palacio, Daniel Rodríguez-Cárdenas, Jonatan Gomez Perdomo

Dynamic Fitness Functions for Genetic Improvement in Compilers and Interpreters
Oliver Krauss, Hanspeter Mössenböck, Michael Affenzeller

DTEO — Decomposition Techniques in Evolutionary Optimization

Organizers: Bilel Derbel (Univ. Lille, Inria Lille - Nord Europe); Hui Li (Xi’an Jiaotong University, China); Ke Li (University of Exeter); Xiaodong Li (RMIT University); Sául Zapotecas Martínez (CINVESTAV-IPN); Qingfu Zhang (City University of Hong Kong, Hong Kong Shenzhen Research Institute)

Time and Location: Monday, July 16, 16:00-17:40, Conference Room A (3F)

A Historical Interdependency based Differential Grouping Algorithm for Large Scale Global Optimization
An Chen, Zhigang Ren, Yang Yang, Yongsheng Liang, Bei Pang

A Cooperative Co-evolutionary Algorithm for Large-Scale Multi-Objective Optimization Problems
Minghan Li, Jingxuan Wei

Decomposition-Based Multiobjective Particle Swarm Optimization for Change Detection in SAR Images
Tao Zhan, Zedong Tang, Maoguo Gong, Xiangming Jiang, Jiao Shi

Selfish vs. Global Behavior Promotion in Car Controller Evolution
Jacopo Talamini, Giovanni Scaini, Eric Medvet, Alberto Bartoli

PDEIM — Parallel and Distributed Evolutionary Inspired Methods

Organizers: Ivano De Falco (ICAR-CNR); Antonio Della Cioppa (Natural Computation Lab - DIEM, University of Salerno); Umberto Scafuri (ICAR-CNR); Ernesto Tarantino (ICAR - CNR)

Time and Location: Monday, July 16, 16:00-17:40, Training Room 1 (2F)

An Actor Model Implementation of Distributed Factored Evolutionary Algorithms
Stephyn G. W. Butcher, John Sheppard

A Parallel Island Model for Biogeography-Based Classification Rule Mining in Julia
Samuel Ebert, Effat Farhana, Steffen Heber

Vectorized Candidate Set Selection for Parallel Ant Colony Optimization
Joshua Peake, Huw Lloyd, Martyn Amos, Paraskevas Yiapanis

Effective Processor Load Balancing using Multi-Objective Parallel Extremal Optimization
Ivano De Falco, Eryk Laskowski, Richard Olejnik, Umberto Scafuri, Ernesto Tarantino, Marek Tudruj
Student Workshop

(Best Student Paper nominees are marked with a star)

Organizers: Youhei Akimoto (University of Tsukuba); Vanessa Volz (TU Dortmund University)

Time and Location: Monday, July 16, 11:00-17:40, Conference Room B (3F)

Specialization and Elitism in Lexicase and Tournament Selection
Edward R. Pantridge, Thomas Helmuth, Nicholas Freitag McPhee, Lee Spector

A Comparison of Semantic-Based Initialization Methods for Genetic Programming
Hammad Ahmad, Thomas Helmuth

Improved Efficiency Of MOPSO With Adaptive Inertia Weight And Dynamic Search Space
Lee Ping Pang, Sin Chun Ng

Using A One-Class Compound Classifier To Detect In-Vehicle Network Attacks
Andrew Tomlinson, Jeremy Bryans, Siraj Ahmed Shaikh

From Fitness Landscape Analysis to Designing Evolutionary Algorithms: The Case Study in Automatic Generation of Function Block Applications ★
Vladimir Mironovich, Maxim Buzdalov, Valeriy Vyatkin

Runtime Analysis of a Population-based Evolutionary Algorithm with Auxiliary Objectives Selected by Reinforcement Learning ★
Denis Antipov, Arina Buzdalova, Andrew Stankevich

Embedded Feature Selection Using Probabilistic Model-Based Optimization ★
Shota Saito, Shinichi Shirakawa, Youhei Akimoto

A Multi-objective Optimization Design Framework for Ensemble Generation ★
Victor Henrique Alves Ribeiro, Gilberto Reynoso Meza

Towards a More General Many-Objective Evolutionary Optimizer using Multi-Indicator Density Estimation ★
Jesús Guillermo Falcón-Cardona, Carlos A. Coello Coello

Diploidy for Evolving Neural Networks
Cara L. Reedy

Analysis of Evolutionary Multi-Tasking as an Island Model
Ryuichi Hashimoto, Hisao Ishibuchi, Naoki Masuyama, Yusuke Nojima

Incorporation of a decision space diversity maintenance mechanism into MOEA/D for multi-modal multi-objective optimization
Chenzu Hu, Hisao Ishibuchi

Weight Vector Grid with New Archive Update Mechanism for Multi-Objective Optimization
Xizi Ni, Hisao Ishibuchi, Kanzhen Wan, Ke Shang, Chukun Zhuang
LBA — Late-Breaking Abstracts

Organizers: Masaharu Munetomo (Hokkaido University)

Time and Location: Monday, July 16, 14:00-17:40, Training Room 2 (2F)

Accelerating Genetic Programming using PyCuda
Keiko Ono, Yoshiko Hanada

Forecasting Soybean Futures Price Using Dynamic Model Averaging and Particle Swarm Optimization
Tao Xiong

A Self-Replication Basis For Designing Complex Agents
Thommen Karimpanal George

Genetically-Trained Deep Neural Networks
Krzysztof Pawelczyk, Michal Kawulok, Jakub Nalepa

The Human-based Evolutionary Computation System Enabling Us to Follow the Solution Evolution
Kousuke Fujimoto, Kei Ohnishi, Tomohiro Yoshikawa

Configuring the Parameters of Artificial Neural Networks using NeuroEvolution and Automatic Algorithm Configuration
Evgenia Papavasileiou, Bart Jansen

Optimization Based Adaptive Tagged Visual Cryptography
Pei-Ling Chiu, Kai-Hui Lee

A Geometric Evolutionary Search for Melody Composition
Yong-Wook Nam, Yong-Hyuk Kim

Distributed NSGA-II Sharing Extreme Non-dominated Solutions
Yuji Sato, Mikiko Sato, Minami Miyakawa

Parameter Space Analysis of Genetic Algorithm Using Support Vector Regression
Hwi-Yeon Cho, Hye-Jin Kim, Yong-Hyuk Kim

Evolutionary Algorithm Using Surrogate Assisted Model for Simultaneous Design Optimization Benchmark Problem of Multiple Car Structures
Hiro Ohtsuka, Misaki Kaidan, Tomohiro Harada, Ruck Thawonmas

On the Hardness of Parameter Optimization of Convolutional Neural Networks Using Genetic Algorithm and Machine Learning
Hyeon-Chang Lee, Dong-Pil Yu, Yong-Hyuk Kim

Infeasible Solution Repair and MOEA/D Sharing Weight Vectors for Solving Multi-objective Set Packing Problems
Mariko Tanaka, Yuki Yamagishi, Hidetoshi Nagai, Hiroyuki Sato

Is It Worth to Approximate Fitness by Machine Learning?: Investigation on the Extensibility According to Problem Size
Dong-Pil Yu, Yong-Hyuk Kim

Importance of Finding a Good Basis in Binary Representation
Junghwan Lee, Yong-Hyuk Kim

Hybrid Swarm of Particle Swarm with Firefly for Complex Function Optimization
Heng Xiao, Toshiharu Hatanaka
Deterministic and Stochastic Precipitation Downscaling using Multi-Objective Genetic Programming  
Tanja Zerenner, Victor Venema, Petra Friederichs, Clemens Simmer

EBIC: a Next-Generation Evolutionary-Based Parallel Biclustering Method  
Patryk Orzechowski, Moshe Sipper, Xiuzhen Huang, Jason H. Moore

Digital Investigations on the Evolution of Prokaryote Photosynthesis Regulation  
Anselmo Pontes, Charles Ofria

Syllabification by Phone Categorization  
Jacob Krantz, Maxwell Dulin, Paul De Palma, Mark VanDam

Evolving Modular Neural Sequence Architectures with Genetic Programming  
David Dohan, David So, Quoc Le

Investigation of Kernel Functions in EDA-GK  
Ryoichi Hasegawa, Hisashi Handa

GA and Entropy Objective Function for Solving Sudoku Puzzle  
Katya Rodriguez-Vazquez

A Surrogate-assisted Selection Scheme for Genetic Algorithms Employing Multi-layer Neural Networks  
Masaki Fujiwara, Masaharu Munetomo
Women@GECCO

Organizers: Khulood Alyahya (Exeter University); Bing Xue (Victoria University of Wellington)

Time and Location: Monday, July 16, 18:00-20:00, Conference Room D (3F)

History of Women@GECCO
  Gabriela Ochoa, University of Stirling

From a PhD student to an independent researcher: Challenges and Opportunities
  Minami Miyakawa, Hosei University

An ongoing pathway to become a leading researcher
  Rong Qu, University of Nottingham

Academic career? Dream big, start small and grow gradually
  Sanaz Mostaghim, Otto von Guericke University Magdeburg

Speed Dating

Panel Discussion Session
Humies, Competitions, Evolutionary Computation in Practice, Hot off the Press, and Job Market
15th Annual Humies Awards for Human Competitive Results

Presentations: Tuesday, July 17, 14:00-15:40
   Training Room 1 (2F)

Announcement of Awards: Thursday, July 19, 12:20-13:50
   Terrsa Hall (1F)

On-location chair: Erik D. Goodman

Judging Panel: Erik D. Goodman, Una-May O’Reilly,
   Wolfgang Banzhaf, Darrell D. Whitley, Lee Spector

Publicity Chair: William Langdon

Prizes: prizes totaling $10,000 to be awarded

Detailed Information: www.human-competitive.org

Techniques of genetic and evolutionary computation are being increasingly applied to difficult real-world problems — often yielding results that are not merely academically interesting, but competitive with the work done by creative and inventive humans. Starting at the Genetic and Evolutionary Computation Conference (GECCO) in 2004, cash prizes have been awarded for human competitive results that had been produced by some form of genetic and evolutionary computation in the previous year.

The total prize money for the Humies awards is $10,000 US dollars. As a result of detailed consideration of the fifteen entries in this year’s Humies competition, eight finalists have been invited to each give a short presentation to the Humies judges at GECCO. Each presentation will be 10 minutes. This presentation session is open to all GECCO attendees. After the session, the judges will confer and select winners for Bronze (either one prize of $2,000 or two prizes of $1,000), Silver ($3,000), and Gold ($5,000) awards. The awards will be announced and presented to their winners during the GECCO closing ceremony on Thursday.
Competitions

Black Box Optimization Competition
Organizers: Ilya Loshchilov, Tobias Glasmachers
Time and Location: Sunday, July 15, 09:30-11:10, Conference Room B (3F)
The Black Box Optimization Competition is the first competition platform in the continuous domain where test problems are truly black boxes to participants. The only information known to optimizer and participant is the dimension of the problem, bounds on all variables, and a budget of black box queries. The competition covers single- and multi-objective optimization. We have five competition tracks.

Competition on Niching Methods for Multimodal Optimization
Organizers: Michael Epitropakis, Mike Preuss, Xiaodong Li, Andries Engelbrecht
Time and Location: Sunday, July 15, 09:30-11:10, Conference Room B (3F)
The aim of the competition is to provide a common platform that encourages fair and easy comparisons across different niching algorithms. The competition allows participants to run their own niching algorithms on 20 benchmark multimodal functions with different characteristics and levels of difficulty.

General Video Game AI Competition
Organizers: Diego Perez-Liebana, Julian Togelius, Simon M. Lucas, Ahmed Khalifa, Michael C. Green
Time and Location: Sunday, July 15, 09:30-11:10, Conference Room B (3F)
The GVG-AI Competition explores the problems within general video game playing. How would you create a level generator that can generate a level for any given game? How could you program an AI that creates new rules for existing games or entirely new games altogether? The level generation track explores the ability of level generators to generalize and work on multiple games described in Video Game Description Language (VGDL). Competitors submit level generators that are tasked to generate levels for any set of game rules. The rule generation track explores the ability to generate game rules and winning conditions for a fixed level of a game described in Video Game Description Language (VGDL).

Internet of Things: Online Anomaly Detection for Drinking Water Quality
Organizers: Frederik Rehbach, Margarita Rebolledo, Steffen Moritz, Sowmya Chandrasekaran, Thomas Bartz-Beielstein
Time and Location: Sunday, July 15, 09:30-11:10, Conference Room B (3F)
For the 7th time in GECCO history, the SPOTSeven Lab is hosting an industrial challenge in cooperation with various industry partners. This year’s challenge, based on the 2017 challenge, is held in cooperation with “Thüringer Fernwasserversorgung” that provides their real-world data set. The task of this years competition is to develop an anomaly detection algorithm for the water- and environmental data set. Early identification of anomalies in water quality data is a challenging task. It is important to identify true undesirable variations in the water quality. At the same time, false alarm rates have to be very low.

Virtual Creatures Competition
Organizers: Sam Kriegman, Nick Cheney, Sebastian Risi, Joel Lehman
Time and Location: Sunday, July 15, 09:30-11:10, Conference Room B (3F)
The Virtual Creatures Competition will be held in the competition session at the Genetic and Evolutionary Computation Conference. The contest’s purpose is to highlight progress in virtual creatures research and showcase evolutionary computation’s ability to craft interesting well-adapted creatures with evolved morphologies and controllers. Video entries demonstrating evolved virtual creatures are judged by technical achievement, aesthetic appeal, innovation, and perceptual animacy (perceived aliveness).
Evolutionary Computation in Practice

Organizers: Thomas Bartz-Beielstein, Institute for Data Science, Engineering, and Analytics, TH Köln
Bogdan Filipic, Jozef Stefan Institute
Shigeru Obayashi, Tohoku University

In the Evolutionary Computation in Practice (ECiP) track, well-known speakers with outstanding reputation in academia and industry present background and insider information on how to establish reliable cooperation with industrial partners. They actually run companies or are involved in cooperations between academia and industry. If you attend, you will learn multiple ways to extend EC practice beyond the approaches found in textbooks. Experts in real-world optimization with decades of experience share their approaches to creating successful projects for real-world clients. Some of what they do is based on sound project management principles, and some is specific to our type of optimization projects. A panel of experts describes a range of techniques you can use to identify, design, manage, and successfully complete an EA project for a client. If you are working in academia and are interested in managing industrial projects, you will receive valuable hints for your own research projects.

Session 1: Bridging the Gap between Academia and Industry
Tuesday, July 17, 10:40-12:20, Conference Room C (3F)
Chair: Bogdan Filipic, Jozef Stefan Institute

Data-Based Modeling and Optimization in Industrial Processes
Michael Affenzeller, Heuristic and Evolutionary Algorithms Lab, University of Applied Sciences Upper Austria

Automated Scheduling of Material Tests in a Chemical Research Lab—Challenges, Pitfalls and Final Implementation
Roland Braune, Department of Business Administration, Faculty of Business, Economics and Statistics, University of Vienna

What they Want and What we Can
Akira Oyama, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency

Session 2: “Real” Real-World Optimization
Tuesday, July 17, 14:00-15:40, Conference Room C (3F)
Chair: Tomoyuki Hiroyasu, Doshisha University

Weight Reduction of Car-Body Structure using Evolutionary Computation and Data-mining
Takehisa Kohira, Technical Research Center, Mazda Motor Corporation

Material Design of Filled Rubbers based on Materials Informatics
Koishi Masataka and Naoya Kowatari, Yokohama Rubber Company

Design Optimization of the Zao Ski Jumping Hill
Seo Kazuya, Department of Science, Yamagata University
Session 3: Ask the Experts / Getting a Job
Tuesday, July 17, 16:00-17:40, Conference Room C (3F)
Chair: Thomas Bartz-Beielstein, Institute for Data Science, Engineering, and Analytics, TH Köln

From University Know-How to a Commercial Product—a Hazardous Journey
Erik D. Goodman, BEACON Center for the Study of Evolution in Action, Michigan State University

Publishing Your Research Work
Ronan Nugent, Springer

Panel Discussion
Hot off the Press

Organizer: Grant Dick, University of Otago

Time and Location: – HOP1: Wednesday, July 18, 10:40-12:20, Conference Room C (3F)
– HOP2: Wednesday, July 18, 15:30-17:10, Conference Room C (3F)
– HOP3: Thursday July 19, 09:00-10:40, Conference Room C (3F)
– HOP4: Thursday, July 19, 09:00-10:40, Conference Room D (3F)

The HOP (Hot Off the Press) track offers authors of recent papers the opportunity to present their work to the GECCO community, both by giving a talk on one of the three main days of the conference and by having a 2-page abstract appear in the Proceedings Companion, in which also the workshop papers, late-breaking abstracts, and tutorials appear. We invite researchers to submit summaries of their own work recently published in top-tier conferences and journals. Contributions are selected based on their scientific quality and their relevance to the GECCO community. Typical contributions include (but are not limited to) evolutionary computation papers appeared at venues different from GECCO, papers comparing different heuristics and optimization methods that appeared at a general heuristics or optimization venue, papers describing applications of evolutionary methods that appeared at venues of this application domain, or papers describing methods with relevance to the GECCO community that appeared at a venue centered around this methods domain. In any case, it is the authors responsibility to make clear why this work is relevant for the GECCO community, and to present the results in a language accessible to the GECCO community.
Job Market

Organizers: Boris Naujoks, TH Köln - Cologne University of Applied Sciences
Tea Tušar, Jozef Stefan Institute

Time and Location: Tuesday, July 17, 12:20-14:00, Terrsa Hall (1F)

The Job Market is a rather new GECCO event where people offering jobs in Evolutionary Computation can advertise open positions and meet with potential candidates. Any kind of positions are of interest (PhD, Postdoc, Professor, Engineer, etc.) — from the academia as well as the industry. After brief presentations of the available jobs, participants have the possibility to set up face-to-face meetings for further discussions.

The collection of positions presented at the job market can be found at the SIGEVO web site: http://sig.sigevo.org/index.html/tiki-index.php?page=Job+Ads+Listing
SIGEVO Summer School
SIGEVO Summer School: S3 2018

Organizer: JJ Merelo, University of Granada

Participants: S3 students and mentors

Dates: July 13-14 (School activities in Osaka)
July 15-19 (Soft merged activities with GECCO), with exclusive S3 activities on July 19

Venue: July 13-14: Blossom Cafe building, Kindai University, Osaka
July 15-19: GECCO venue

Mentors: Dr. Anna Esparcia Alcázar
Dr. Juan Julián Merelo Guervós
Dr. Francisco Fernández de la Vega
Dr. José Mario García Valdez
Dr. Marc Schoenauer

SIGEVO is a special interest group of ACM always looking for new ways to enlarge the community of researchers working in different biologically inspired metaheuristics. The second SigEvo Summer School (S3) will be held in conjunction with GECCO 2018 in Kyoto. The core of the second S3 will take place in Osaka in the days previous to the conference, and will continue in daily interactions during the conference proper in Kyoto, finishing in the same day of the conference later in the afternoon. That way, students will be able to enjoy and learn during the conference proper at the same time they meet researchers and advance in their learning tasks. GECCO tutorials, workshops, and papers will be an integral part of the S3.

During the S3, the students will first decide on a problem to tackle, and then work on it to produce, by the end of the school, an interactive presentation including a report, data, interactive notebooks and free software. This will be done through teamwork and online cooperation, with an open science approach. After the two initial sessions (in Osaka) where the students will get to meet each other and create work teams, the mentors will design an itinerary for every student through the tutorials, workshops and sessions, which they will then comment on during daily checkpoints.

By the end of the summer school, they will have created an interactive notebook that will be presented and defended in front their peers.

Important comments:

- Mentors will consider at all times the high variety of students in terms of research maturity, culture, and research preferences (i.e., will offer assorted assignments).
- Students will participate in every activity of the school to the extent of their availability.

Blossom Café in Osaka, were the first sessions of S3 will take place
**Friday, July 13**  
(before GECCO)

Presentation, group dynamics and presentation of group tools, scientific programming and visualization tools. Team building and design thinking session for elaboration of projects.

**Saturday, July 14**  
(before GECCO)

Team presentation and mentoring choice and assignment. Mentors working with teams for on-demand talks and tutorials. Short presentations in the afternoon, and personal tutoring sessions.

**Sunday, July 15 — Thursday, July 19**  
(during GECCO)

Attending tutorials and workshops. Lunchtime meetings with tutors, after-work meeting for scheduling the next days and choose tracks and papers to attend. Most interaction will take place in the online collaboration tools that will be set up for the participants.

**Thursday, July 19 (Afternoon)**  
(after GECCO)

Lunchtime general meeting, and afternoon hackathon, presentation editing and delivery.
Best Paper Nominations
Best Paper Nominations

Voting Instructions

Beware: In contrast to previous years, GECCO attendees can only vote for one best paper session this year. This means that one needs to choose beforehand in which session to vote.

Procedure: Each track, or group of small tracks, has designated a few nominees (see the lists below). The papers in competition for the same Award are presented in the same session, and the vote for this Award takes place at the end of the session. The votes are nominative, and cannot be delegated to another attendee.

To be allowed to vote one needs to:
- Attend the entire corresponding best paper session;
- Handle the nominative voting voucher distributed with the registration material.

Voting procedure:
- At the beginning of the session, the voting ballots are distributed in the audience by the session chair;
- At the end of the session, the session chair collects the voting ballots and the nominative voting vouchers, checking the badge/voucher match.

CS — Complex Systems

Safe Mutations for Deep and Recurrent Neural Networks through Output Gradients
Joel Lehman, Jay Chen, Jeff Clune, Kenneth O. Stanley
Tuesday, July 17, 16:00-16:25, Conference Room Medium (2F)

Data-efficient Neuroevolution with Kernel-Based Surrogate Models
Adam Gaier, Alexander Asteroth, Jean-Baptiste Mouret
Tuesday, July 17, 16:25-16:50, Conference Room Medium (2F)

Evolution of a Functionally Diverse Swarm via a Novel Decentralised QD Algorithm
Emma Hart, Andreas Siegfried Wilhelm Steyven, Ben Paechter
Tuesday, July 17, 16:50-17:15, Conference Room Medium (2F)

DETA — Digital Entertainment Technologies and Arts

Evolving Mario Levels in the Latent Space of a Deep Convolutional Generative Adversarial Network
Vanessa Volz, Jacob Schrum, Jialin Liu, Simon M. Lucas, Adam M. Smith, Sebastian Risi
Wednesday, July 18, 15:30-15:55, Conference Room Medium (2F)

ECOM — Evolutionary Combinatorial Optimization and Metaheuristics

One-Class Constraint Acquisition with Local Search
Daniel Sroka, Tomasz P. Pawlak
Wednesday, July 18, 11:05-11:30, Terrsa Hall (1F)

Enhancing Partition Crossover with Articulation Points Analysis
Francisco Chicano, Gabriela Ochoa, Darrell D. Whitley, Renato Tinós
Wednesday, July 18, 10:40-11:05, Terrsa Hall (1F)
EML — Evolutionary Machine Learning

**Evolved GANs for generating Pareto set approximations**
Unai Garciaarena, Alexander Mendiburu, Roberto Santana
*Tuesday, July 17, 10:40-11:05, Terrsa Hall (1F)*

**Evolving Bagging Ensembles Using a Spatially-Structured Niching Method**
Grant Dick, Caitlin A. Owen, Peter A. Whigham
*Tuesday, July 17, 11:30-11:55, Terrsa Hall (1F)*

**What About Interpolation? A Radial Basis Function Approach to Classifier Prediction Modeling in XCSF**
Anthony Stein, Simon Menssen, Jörg Hähner
*Tuesday, July 17, 11:05-11:30, Terrsa Hall (1F)*

EMO — Evolutionary Multiobjective Optimization

**Data-Driven Analysis of Pareto Set Topology**
Naoki Hamada, Keisuke Goto
*Thursday, July 19, 10:15-10:40, Terrsa Hall (1F)*

**Multi-Objective Evolutionary Hyper-heuristic based on Multiple Indicator-based Density Estimators**
Jesús Guillermo Falcón-Cardona, Carlos A. Coello Coello
*Thursday, July 19, 09:25-09:50, Terrsa Hall (1F)*

**A new R2 indicator for better hypervolume approximation**
Ke Shang, Hisao Ishibuchi, Min-Ling Zhang, Yiping Liu
*Thursday, July 19, 09:50-10:15, Terrsa Hall (1F)*

ENUM — Evolutionary Numerical Optimization

**An Empirical Comparison of Metamodelling Strategies in Noisy Environments**
Sunith Bandaru, Amos H.C. Ng
*Thursday, July 19, 09:25-09:50, Conference Room Medium (2F)*

**PSA-CMA-ES: CMA-ES with Population Size Adaptation**
Kouhei Nishida, Youhei Akimoto
*Thursday, July 19, 09:00-09:25, Conference Room Medium (2F)*

GA — Genetic Algorithms

**Runtime Analysis of Probabilistic Crowding and Restricted Tournament Selection for Bimodal Optimisation**
Edgar Covantes Osuna, Dirk Sudholt
*Wednesday, July 18, 15:30-15:55, Terrsa Hall (1F)*

**Tunneling Between Plateaus: Improving on a State-of-the-Art MAXSAT Solver using Partition Crossover**
Wenxiang Chen, Darrell D. Whitley, Francisco Chicano, Renato Tinós
*Wednesday, July 18, 15:55-16:20, Terrsa Hall (1F)*

**Learning Bayesian Network Structures with GOMEA**
Kalia Orphanou, Dirk Thierens, Peter A.N. Bosman
Wednesday, July 18, 16:20-16:45, Terrsa Hall (1F)

GECH — General Evolutionary-Computation and Hybrids

**Working Principles of Binary Differential Evolution**
Weijie Zheng, Guangwen Yang, Benjamin Doerr
*Wednesday, July 18, 16:20-16:45, Conference Room Medium (2F)*

GP — Genetic Programming

**Program Synthesis using Uniform Mutation by Addition and Deletion**
Thomas Helmuth, Nicholas Freitag McPhee, Lee Spector
*Wednesday, July 18, 11:30-11:55, Conference Room Medium (2F)*

**Solving the Exponential Growth of Symbolic Regression Trees in Geometric Semantic Genetic Programming**
Joao Francisco Barreto da Silva Martins, Luiz Otavio Vilas Boas Oliveira, Luis Fernando Miranda, Felipe Casadei, Gisele Lobo Pappa
*Wednesday, July 18, 10:40-11:05, Conference Room Medium (2F)*

**Where are we now? A large benchmark study of recent symbolic regression methods**
Patryk Orzechowski, William La Cava, Jason H. Moore
*Wednesday, July 18, 11:05-11:30, Conference Room Medium (2F)*

RWA — Real World Applications

**Genetic Programming for Tuberculosis Screening from Raw X-ray Images**
Armand Rashad Burks, William Fitzgerald Punch
*Tuesday, July 17, 14:25-14:50, Conference Room Medium (2F)*

**Benchmarking Evolutionary Computation Approaches to Insider Threat Detection**
Duc C. Le, Sara Khanchi, Nur Zincir-Heywood, Malcolm Heywood
*Tuesday, July 17, 14:50-15:15, Conference Room Medium (2F)*

THEORY — Theory

**Domino Convergence: Why One Should Hill-Climb on Linear Functions**
Carsten Witt
*Wednesday, July 18, 15:55-16:20, Conference Room Medium (2F)*
Papers and Posters
CS1
Tuesday, July 17, 10:40-12:20, AV Study Room (2F)
Chair: Joel Lehman (Uber Technologies Inc.)

Fusing Novelty and Surprise for Evolving Robot Morphologies
Daniele Gravina, Antonios Liapis, Georgios N. Yannakakis 10:40-11:05

Real-World Evolution Adapts Robot Morphology and Control to Hardware Limitations
Tønnes F. Nygaard, Charles Patrick Martin, Eivind Samuelsen, Jim Torresen, Kyrre Glette 11:05-11:30

Interoceptive robustness through environment-mediated morphological development
Sam Kriegman, Nick Cheney, Francesco Corucci, Josh C. Bongard 11:30-11:55

Towards the Targeted Environment-Specific Evolution of Robot Components

DETA1
Tuesday, July 17, 10:40-12:20, Conference Room Medium (2F)
Chair: Julian Togelius (IT University of Copenhagen)

Evolving Indirectly Encoded Convolutional Neural Networks to Play Tetris With Low-Level Features
Jacob Schrum 10:40-11:05

Evolving simple programs for playing Atari games
Dennis Wilson, Sylvain Cussat-Blanc, Hervé Luga, Julian F. Miller 11:05-11:30

Opponent Modeling and Exploitation in Poker Using Evolved Recurrent Neural Networks
Xun Li, Risto Miikkulainen 11:30-11:55

Generating Beginner Heuristics for Simple Texas Hold’em
Fernando De Mesentier Silva, Julian Togelius, Frank Lantz, Andy Nealen 11:55-12:20

ECOM1
Tuesday, July 17, 10:40-12:20, Conference Room 2 (3F)
Chair: Thomas Stützle (Université Libre de Bruxelles)

A heuristic algorithm based on Tabu Search for the solution of Flexible Job Shop Scheduling Problems with Lot Streaming
Miguel Ángel Fernández Romero, Eric Alfredo Rincón García, Antonin Ponsich, Roman Anselmo Mora Gutiérrez 10:40-11:05

Iterated Greedy Algorithms for the Hybrid Flowshop Scheduling with Total Flow Time Minimization
Hande Öztop, M. Fatih Tasgetiren, Deniz Türsel Eliyi, Quan-Ke Pan 11:05-11:30

An effective hybrid meta-heuristic for a heterogeneous flow shop scheduling problem
Matheus de Freitas Araujo, Jose Elias Claudio Arroyo, Ricardo Goncalves Tavares 11:30-11:55

Min-Conflicts Heuristic for Multi-Mode Resource-Constrained Projects Scheduling
Arben Ahmeti, Nysret Musliu 11:55-12:20
**EML1: Best Papers**

Tuesday, July 17, 10:40-12:20, Terrsa Hall (1F)

Chair: Will Neil Browne (Victoria University of Wellington); Yusuke Nojima (Osaka Prefecture University)

*(Best Paper nominees are marked with a star)*

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**Evolved GANs for generating Pareto set approximations ★**

Unai Garcíaarena, Alexander Mendiburu, Roberto Santana

10:40-11:05

**What About Interpolation? A Radial Basis Function Approach to Classifier Prediction Modeling in XCSF ★**

Anthony Stein, Simon Menssen, Jörg Hähner

11:05-11:30

**Evolving Bagging Ensembles Using a Spatially-Structured Niching Method ★**

Grant Dick, Caitlin A. Owen, Peter A. Whigham

11:30-11:55

**Attribute Tracking: Strategies Towards Improved Detection and Characterization of Complex Associations**

Ryan Urbanowicz, Christopher Lo, John Holmes, Jason H. Moore

11:55-12:20

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**EMO1**

Tuesday, July 17, 10:40-12:20, Conference Room D (3F)

Chair: Boris Naujoks (TH Köln - University of Applied Sciences)

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**An Improved Version of a Reference-Based Multi-Objective Evolutionary Algorithm based on IGD+**

Edgar Manoatl Lopez, Carlos A. Coello Coello

10:40-11:05

**Two Enhancements for Improving the Convergence Speed of a Robust Multi-Objective Coevolutionary Algorithm**

Alexandru-Ciprian Zavoianu, Susanne Saminger-Platz, Edwin Lughofer, Wolfgang Amrhein

11:05-11:30

**Evolutionary Computation plus Dynamic Programming for the Bi-Objective Travelling Thief Problem**

Junhua Wu, Sergey Polyakovskiy, Markus Wagner, Frank Neumann

11:30-11:55

**Parallel Pareto Local Search Revisited - First experimental results on Bi-objective UBQP**

Jialong Shi, Qingfu Zhang, Bilel Derbel, Arnaud Liefooghe, Jianyong Sun

11:55-12:20

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**ENUM1**

Tuesday, July 17, 10:40-12:20, Training Room 1 (2F)

Chair: Jose A. Lozano (University of the Basque Country)

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**Drift Theory in Continuous Search Spaces: Expected Hitting Time of the (1+1)-ES with 1/5 Success Rule**

Youhei Akimoto, Anne Auger, Tobias Glasmachers

10:40-11:05

**Real-Valued Evolutionary Multi-Modal Optimization driven by Hill-Valley Clustering**

Stef C. Maree, Tanja Alderliesten, Dirk Thierens, Peter A.N. Bosman

11:05-11:30

**Adaptive Threshold Parameter Estimation with Recursive Differential Grouping for Problem Decomposition**
Yuan Sun, Mohammad Nabi Omidvar, Michael Kirley, Xiaodong Li 11:30-11:55

GA1
Tuesday, July 17, 10:40-12:20, Conference Room B (3F)
Chair: Darrell Whitley (Colorado State University)

Analysis of the Use of Genetic Algorithms for Indoor Localisation via Cloud Point Matching
Miguel d’Arcangues Boland, Leandro Soares Indrusiak 10:40-11:05

Shaper-GA: Automatic Shape Generation for Modular House Design
Ana Maria Carvalho de Almeida, Bruno Taborda, Filipe Santos, Krystian Kwiecinski, Sara Eloy 11:05-11:30

Towards a Theory-Guided Benchmarking Suite for Discrete Black-Box Optimization: Profiling (1 + λ)
EA Variants on OneMax and LeadingOnes
Carola Doerr, Furong Ye, Sander van Rijn, Hao Wang, Thomas Bäck 11:30-11:55

GECH1
Tuesday, July 17, 10:40-12:20, Training Room 2 (2F)
Chair: Juergen Branke (University of Warwick)

Adaptive Asynchrony in Semi-Asynchronous Evolutionary Algorithm Based on Performance Prediction Using Search History
Tomohiro Harada 10:40-11:05

Memetic Algorithms Beat Evolutionary Algorithms on the Class of Hurdle Problems
Phan Trung Hai Nguyen, Dirk Sudholt 11:05-11:30

Termination Detection Strategies in Evolutionary Algorithms: A Survey
Yanfeng Liu, Aimin Zhou, Hu Zhang 11:30-11:55

RWA1
Tuesday, July 17, 10:40-12:20, Training Room 3 (2F)
Chair: Una-May O’Reilly (CSAIL, Massachusetts Institute of Technology)

Multi-Objective Journey Planning Under Uncertainty: A Genetic Approach
Mohammad Haqqani, Xiaodong Li, Xinghuo Yu 10:40-11:05

A Genetic Programming based Iterated Local Search for Software Project Scheduling
Nasser R. Sabar, Ayad Turky, Andy Song 11:05-11:30

Estimating Cement Compressive Strength from Microstructural Images using GEP with Probabilistic Polarized Similarity Weight Tournament Selection
Liangliang Zhang, Xinya Yue, Lin Wang, Bo Yang 11:30-11:55

Evolving Boolean Functions for Fast and Efficient Randomness Testing
Vojtech Mrazek, Marek Sýs, Zdenek Vasicek, Lukas Sekanina, Vashek Matyas 11:55-12:20
Runtime Analysis for Self-adaptive Mutation Rates  
Benjamin Doerr, Carsten Witt, Jing Yang  
10:40-11:05

The linear hidden subset problem for the (1+1) EA with scheduled and adaptive mutation rates  
Hafsteinn Einarsson, Marcelo Matheus Gauy, Johannes Lengler, Florian Meier, Asier Mujika, Angelika Steger, Felix Weißenberger  
11:05-11:30

A Tight Runtime Analysis for the (\(\mu + \lambda\)) EA  
Denis Antipov, Benjamin Doerr, Jiefeng Fang, Tangi Hetet  
11:30-11:55
ACO-SI1
Tuesday, July 17, 14:00-15:40, Conference Room B (3F)
Chair: Andries P. Engelbrecht (University of Pretoria)

A New Foraging-Based Algorithm for Online Scheduling
Koen van der Blom, Thomas Bäck 14:00-14:25

Information Sharing and Conflict Resolution in Distributed Factored Evolutionary Algorithms
Stephyn G. W. Butcher, John Sheppard, Shane Strasser 14:25-14:50

Recurrent Neural Network-Predictions for PSO in Dynamic Optimization
Almuth Meier, Oliver Kramer 14:50-15:15

A Model of Artificial Emotions for Behavior-Modulation and Implicit Coordination in Multi-robot Systems
Jerome Guzzi, Alessandro Giusti, Luca Maria Gambardella, Gianni A. Di Caro 15:15-15:40

ECOM2
Tuesday, July 17, 14:00-15:40, Conference Room 2 (3F)
Chair: Frank Neumann (The University of Adelaide)

Memetic Multilevel Hypergraph Partitioning
Sebastian Schlag, Christian Schulz, Robin Andre 14:00-14:25

Randomized Greedy Algorithms for Covering Problems
Wanru Gao, Tobias Friedrich, Frank Neumann, Christian Hercher 14:25-14:50

Evolutionary Multi-Level Acyclic Graph Partitioning
Orlando Moreira, Merten Popp, Christian Schulz 14:50-15:15

A Multi-objective Formulation of the Team Formation Problem in Social Networks: Preliminary Results
Carlos Brizuela, Julio Juarez 15:15-15:40

EML2
Tuesday, July 17, 14:00-15:40, Training Room 2 (2F)
Chair: Jeff Clune (Uber Technologies Inc., University of Wyoming)

Autostacker: A Compositional Evolutionary Learning System
Boyuan Chen, Harvey Wu, Warren Mo, Ishanu Chattopadhyay, Hod Lipson 14:00-14:25

Cooperative Multi-Objective Evolutionary Support Vector Machines for Multiclass Problems
Alejandro Rosales-Pérez, Andres Eduardo Gutierrez-Rodriguez, Salvador García, Hugo Terashima-Marín, Carlos A. Coello Coello, Francisco Herrera 14:25-14:50

Evolutionary Feature Subspaces Generation for Ensemble Classification
Boyu Zhang, A. K. Qin, Timos Sellis 14:50-15:15

ES Is More Than Just a Traditional Finite-Difference Approximator
Joel Lehman, Jay Chen, Jeff Clune, Kenneth O. Stanley 15:15-15:40
EMO2
Tuesday, July 17, 14:00-15:40, Conference Room D (3F)
Chair: Arnaud Liefooghe (Univ. Lille, Inria Lille - Nord Europe)

A Taxonomy of Methods for Visualizing Pareto Front Approximations
Bogdan Filipic, Tea Tusar 14:00-14:25

mQAPViz: A divide-and-conquer multi-objective optimization algorithm to compute large data visualizations
Claudio Sanhueza, Francia Jiménez, Regina Berretta, Pablo Moscato 14:25-14:50

Surrogate-assisted Evolutionary Biobjective Optimization for Objectives with Non-uniform Latencies
Tinkle Chugh, Richard Allmendinger, Vesa Ojalehto, Kaisa Miettinen 14:50-15:15

A set-oriented MOEA/D
Bilel Derbel, Arnaud Liefooghe, Qingfu Zhang, Sébastien Verel, Hernán Aguirre, Kiyoshi Tanaka 15:15-15:40

GECH2
Tuesday, July 17, 14:00-15:40, Training Room 3 (2F)
Chair: Yaocuo Jin (University of Surrey)

Expected Improvement of Constraint Violation for Expensive Constrained Optimization
Ruwang Jiao, Sanyou Zeng, Changhe Li, Yuhong Jiang, Junchen Wang 14:00-14:25

Talakat: Bullet Hell Generation through Constrained Map-Elites
Ahmed Khalifa, Scott Lee, Andy Nealen, Julian Togelius 14:25-14:50

Neural Estimation of Interaction Outcomes
Paweł Liskowski, Bartosz Wieloch, Krzysztof Krawiec 14:50-15:15

Cooperative Co-evolution with Online Optimizer Selection for Large-Scale Optimization
Yuan Sun, Michael Kirley, Xiaodong Li 15:15-15:40

GP1
Tuesday, July 17, 14:00-15:40, AV Study Room (2F)
Chair: Lee Spector (Hampshire College, University of Massachusetts Amherst)

Evolving Event-driven Programs with SignalGP
Alexander Lalejini, Charles Ofria 14:00-14:25

An Analysis of the Bias of Variation Operators of Estimation of Distribution Programming
Dirk Schweim, Franz Rothlauf 14:25-14:50

Schema-based Diversification in Genetic Programming
Bogdan Burlacu, Michael Affenzeller 14:50-15:15

Towards Effective Semantic Operators for Program Synthesis in Genetic Programming
Stefan Forstenlechner, David Fagan, Miguel Nicolau, Michael O’Neill 15:15-15:40
**RWA2: Best Papers**
Tuesday, July 17, 14:00-15:40, Conference Room Medium (2F)
Chair: Anna Isabel Esparcia-Alcazar (Universitat Politècnica de València)

(Best Paper nominees are marked with a star)

A Detailed Comparison of Meta-Heuristic Methods for Optimising Wave Energy Converter Positions
Mehdi Neshat, Bradley Alexander, Markus Wagner, Yuanzhong Xia  
14:00-14:25

Genetic Programming for Tuberculosis Screening from Raw X-ray Images ★
Armand Rashad Burks, William Fitzgerald Punch  
14:25-14:50

Benchmarking Evolutionary Computation Approaches to Insider Threat Detection ★
Duc C. Le, Sara Khanchi, Nur Zincir-Heywood, Malcolm Heywood  
14:50-15:15

**THEORY2**
Tuesday, July 17, 14:00-15:40, Conference Room A (3F)
Chair: Martin S. Krejca (Hasso Plattner Institute)

Significance-based Estimation-of-Distribution Algorithms
Benjamin Doerr, Martin S. Krejca  
14:00-14:25

Medium Step Sizes are Harmful for the Compact Genetic Algorithm
Johannes Lengler, Dirk Sudholt, Carsten Witt  
14:25-14:50

Crossover Can Simulate Bounded Tree Search on a Fixed-Parameter Tractable Optimization Problem
Andrew M. Sutton  
14:50-15:15
<table>
<thead>
<tr>
<th>CS2: Best Papers</th>
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<td>Tuesday, July 17, 16:00-17:40, Conference Room Medium (2F)</td>
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<td>Chair: Sebastian Risi (IT University of Copenhagen)</td>
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<tr>
<td>(Best Paper nominees are marked with a star)</td>
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<tr>
<td>Safe Mutations for Deep and Recurrent Neural Networks through Output Gradients ★</td>
</tr>
<tr>
<td>Data-efficient Neuroevolution with Kernel-Based Surrogate Models ★</td>
</tr>
<tr>
<td>Evolution of a Functionally Diverse Swarm via a Novel Decentralised QD Algorithm ★</td>
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<td>ECOM3</td>
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<td>Tuesday, July 17, 16:00-17:40, Conference Room 2 (3F)</td>
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<tr>
<td>Chair: Bilel Derbel (Univ. Lille, Inria Lille - Nord Europe)</td>
</tr>
<tr>
<td>Escaping Large Deceptive Basins of Attraction with Heavy-Tailed Mutation Operators</td>
</tr>
<tr>
<td>Improving the Run Time of the (1+1) Evolutionary Algorithm with Luby Sequences</td>
</tr>
<tr>
<td>Dominance, Epsilon, and Hypervolume Local Optimal Sets in Multi-objective Optimization, and How to Tell the Difference</td>
</tr>
<tr>
<td>A two-level diploid genetic based algorithm for solving the family traveling salesman problem</td>
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<tr>
<td>EML3</td>
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<tr>
<td>Tuesday, July 17, 16:00-17:40, Training Room 2 (2F)</td>
</tr>
<tr>
<td>Chair: Ryan Urbanowicz (University of Pennsylvania)</td>
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<tr>
<td>Theoretical Adaptation of Multiple Rule-Generation in XCS</td>
</tr>
<tr>
<td>Towards an Adaptive Encoding for Evolutionary Data Clustering</td>
</tr>
<tr>
<td>A Genetic Algorithm for Finding an Optimal Curing Strategy for Epidemic Spreading in Weighted Networks</td>
</tr>
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</table>

EMO3
Tuesday, July 17, 16:00-17:40, Conference Room D (3F)
Chair: Qingfu Zhang (City University of Hong Kong, Shenzhen Research Institute)

MOEA/D with Uniformly Randomly Adaptive Weights
Lucas Rodolfo Celestino Farias, Pedro Henrique Magalhães Braga, Hansencleaver França Bassani, Aluizio Fausto Ribeiro Araújo 16:00-16:25

Dual-Grid Model of MOEA/D for Evolutionary Constrained Multiobjective Optimization
Hisao Ishibuchi, Takafumi Fukase, Naoki Masuyama, Yusuke Nojima 16:25-16:50

Directed Mating in Decomposition-based MOEA for Constrained Many-objective Optimization
Minami Miyakawa, Hiroyuki Sato, Yuji Sato 16:50-17:15

Component-level study of a decomposition-based multi-objective optimizer on a limited evaluation budget
Oliver P. H. Jones, Jeremy E. Oakley, Robin C. Purshouse 17:15-17:40

ENUM2
Tuesday, July 17, 16:00-17:40, Training Room 1 (2F)
Chair: Alexander Mendiburu (University of the Basque Country UPV/EHU)

Learning-Based Topology Variation in Evolutionary Level Set Topology Optimization
Mariusz Bujny, Nikola Aulig, Markus Olhofer, Fabian Duddeck 16:00-16:25

Analysis of Evolution Strategies with the Optimal Weighted Recombination
Chun-kit Au, Ho-fung Leung 16:25-16:50

A Global Information Based Adaptive Threshold for Grouping Large Scale Global Optimization Problems
An Chen, Yipeng Zhang, Yang Yang, Zhigang Ren, Yongsheng Liang, Bei Pang 16:50-17:15

GA2
Tuesday, July 17, 16:00-17:40, Conference Room B (3F)
Chair: Dirk Thierens (Utrecht University)

Grammatical Evolution Algorithm for Evolution of Swarm Behaviors
Aadesh Neupane, Michael A. Goodrich, Eric G. Mercer 16:00-16:25

Learning an Evolvable Genotype-Phenotype Mapping
Matthew Andres Moreno, Banzhaf Wolfgang, Charles Ofria 16:25-16:50

Serendipitous Scaffolding to improve a Genetic Algorithm’s Speed and Quality
Heather J. Goldsby, Rebecca L. Young, Jory Schossau, Hans A. Hofmann, Arend Hintze 16:50-17:15
GECH3
Tuesday, July 17, 16:00-17:40, Conference Room A (3F)
Chair: Jonathan Edward Fieldsend (University of Exeter)

Quasi-Bistability of Walk-Based Landscape Measures in Stochastic Fitness Landscapes
Bernhard Werth, Erik Pitzer, Gerald Ostermayer, Michael Affenzeller 16:00-16:25

Changing or Keeping Solutions in Dynamic Optimization Problems with Switching Costs
Danial Yazdani, Juergen Branke, Mohammad Nabi Omidvar, Trung Thanh Nguyen, Xin Yao 16:25-16:50

Sequential Sampling for Noisy Optimisation with CMA-ES
Matthew Groves, Juergen Branke 16:50-17:15

GP2
Tuesday, July 17, 16:00-17:40, AV Study Room (2F)
Chair: Wolfgang Banzhaf (Memorial University of Newfoundland, NSF Beacon Center for the Study of Evolution in Action)

Genetic Programming Approach to Learning Multi-pass Heuristics for Resource Constrained Job Scheduling
Su Nguyen, Dhananjay Thiruvady, Andreas T. Ernst, Damminda Alahakoon 16:00-16:25

Adaptive Charting Genetic Programming for Dynamic Flexible Job Shop Scheduling
Su Nguyen, Mengjie Zhang, Kay Chen Tan, Damminda Alahakoon 16:25-16:50

Measuring Evolvability and Accessibility using the Hyperlink-Induced Topic Search Algorithm
Kyle Nickerson, Yuanzhu Chen, Feng Wang, Ting Hu 16:50-17:15

Neuro-Guided Genetic Programming: Prioritizing Evolutionary Search with Neural Networks
Paweł Liskowski, Iwo Bładek, Krzysztof Krawiec 17:15-17:40

RWA3
Tuesday, July 17, 16:00-17:40, Training Room 3 (2F)
Chair: Peter Bosman (Centrum Wiskunde & Informatica (CWI))

Informed Mutation Operator using Machine Learning for Optimization in Epidemics Prevention
Krzysztof Michalak 16:00-16:25

Symbolic Regression and Feature Construction with GP-GOMEA applied to Radiotherapy Dose Reconstruction of Childhood Cancer Survivors
Marco Virgolin, Tanja Alderliesten, Arjan Bel, Cees Witteveen, Peter A.N. Bosman 16:25-16:50

Better and Faster Catheter Position Optimization in HDR Brachytherapy for Prostate Cancer using Multi-Objective Real-Valued GOMEA
Marjolein C. van der Meer, Bradley R. Pieters, Yury Niatsetski, Tanja Alderliesten, Arjan Bel, Peter A.N. Bosman 16:50-17:15

Large-Scale Parallelization of Partial Evaluations in Evolutionary Algorithms for Real-World Problems
Anton Bouter, Tanja Alderliesten, Arjan Bel, Cees Witteveen, Peter A.N. Bosman 17:15-17:40
Paper Sessions, Wednesday, July 18, 10:40-12:20

CS3
Wednesday, July 18, 10:40-12:20, AV Study Room (2F)
Chair: Nicolas Bredeche (Sorbonne Université, CNRS)

Robotic Snake Simulation using Ensembles of Artificial Neural Networks in Evolutionary Robotics
Grant Warren Woodford, Mathys Cornelius du Plessis 10:40-11:05

Discovering the Elite Hypervolume by Leveraging Interspecies Correlation
Vassilis Vassiliades, Jean-Baptiste Mouret 11:05-11:30

A Robot to Shape your Natural Plant: The Machine Learning Approach to Model and Control Bio-Hybrid Systems
Mostafa Wahby, Mary Katherine Heinrich, Daniel Nicolas Hofstadler, Payam Zahadat, Sebastian Risi, Phil Ayres, Thomas Schmickl, Heiko Hamann 11:30-11:55

Evolution of Fin Undulation on a Physical Knifefish-inspired Soft Robot
Frank Veenstra, Jonas Jørgensen, Sebastian Risi 11:55-12:20

ECOM4: Best Papers
Wednesday, July 18, 10:40-12:20, Terrsa Hall (1F)
Chair: Sebastien Verel (Université du Littoral Côte d’Opale) (Best Paper nominees are marked with a star)

Enhancing Partition Crossover with Articulation Points Analysis ★
Francisco Chicano, Gabriela Ochoa, Darrell D. Whitley, Renato Tinós 10:40-11:05

One-Class Constraint Acquisition with Local Search ★
Daniel Sroka, Tomasz P. Pawlak 11:05-11:30

A Merge Search Algorithm and its Application to the Constrained Pit Problem in Mining
Angus Kenny, Xiaodong Li, Andreas T. Ernst 11:30-11:55

EML4
Wednesday, July 18, 10:40-12:20, Training Room 2 (2F)
Chair: Kenneth Stanley (Uber Technologies Inc., University of Central Florida)

NEAT for Large-Scale Reinforcement Learning through Evolutionary Feature Learning and Policy Gradient Search

Combating catastrophic forgetting with developmental compression.
Shawn L. Beaulieu, Sam Kriegman, Josh C. Bongard 11:05-11:30

Neuroevolution of Hierarchical Reservoir Computers
Matthew Dale 11:30-11:55
EMO4
Wednesday, July 18, 10:40-12:20, Conference Room D (3F)
Chair: Dimo Brockhoff (INRIA Saclay - Ile-de-France; CMAP, Ecole Polytechnique)

Collaborative Multi-Objective Optimization for Distributed Design of Complex Products
Joao Antonio Fialho Vilas Boas Duro, Yiming Yan, Robin C. Purshouse, Peter J. Fleming 10:40-11:05

Transfer Strategies from Single- to Multi-objective Grouping Mechanisms
Frederick Sander, Heiner Zille, Sanaz Mostaghim 11:05-11:30

Generalized Offline Orthant Search: One Code for Many Problems in Multiobjective Optimization
Maxim Buzdalov 11:30-11:55

Improving the Performance of MO-RV-GOMEA on Problems with Many Objectives using Tchebycheff Scalarizations
Ngoc Hoang Luong, Tanja Alderliesten, Peter A.N. Bosman 11:55-12:20

EMO5
Wednesday, July 18, 10:40-12:20, Conference Room 2 (3F)
Chair: Ke Li (University of Exeter)

A Differential Prediction Model for Evolutionary Dynamic Multiobjective Optimization
Leilei Cao, Lihong Xu, Erik D. Goodman, Shuwei Zhu, Hui Li 10:40-11:05

Less Detectable Environmental Changes in Dynamic Multiobjective Optimisation
Shouyong Jiang, Marcus Kaiser, Jinglei Guo, Shengxiang Yang, Natalio Krasnogor 11:05-11:30

A Steady-State NSGA-II based Multi-objective Multicast Routing Algorithm for Optical Networks
Ying Xu, Yan Zhou 11:30-11:55

Multiobjective Sparse Unmixing Approach with Noise Removal
Xiangming Jiang, Maoguo Gong, Tao Zhan, Zedong Tang 11:55-12:20

ENUM3
Wednesday, July 18, 10:40-12:20, Training Room 1 (2F)
Chair: Anne Auger (INRIA; CMAP, Ecole Polytechnique)

A Novel Similarity-based Mutant Vector Generation Strategy for Differential Evolution
Eduardo Segredo, Eduardo Lalla-Ruiz, Emma Hart 10:40-11:05

Expanding variational autoencoders for learning and exploiting latent representations in search distributions
Unai Garciaarena, Roberto Santana, Alexander Mendiburu 11:05-11:30

Analysis of Information Geometric Optimization with Isotropic Gaussian Distribution Under Finite Samples
Kento Uchida, Youhei Akimoto, Shinichi Shirakawa 11:30-11:55

Inheritance-Based Diversity Measures for Explicit Convergence Control in Evolutionary Algorithms
Thomas Gabor, Lenz Belzner, Claudia Linnhoff-Popien 11:55-12:20
Simple On-the-Fly Parameter Selection Mechanisms for Two Classical Discrete Black-Box Optimization Benchmark Problems
Carola Doerr, Markus Wagner 10:40-11:05

Investigation of the Exponential Population Scheme for Genetic Algorithms
Yuen-Jen Lin, Tian-Li Yu 11:05-11:30

On the Runtime Dynamics of the Compact Genetic Algorithm on Jump Functions
Václav Hasenöhrl, Andrew M. Sutton 11:30-11:55

Discrepancy-Based Evolutionary Diversity Optimization
Aneta Neumann, Wanru Gao, Carola Doerr, Frank Neumann, Markus Wagner 11:55-12:20

Solving the Exponential Growth of Symbolic Regression Trees in Geometric Semantic Genetic Programming

Where are we now? A large benchmark study of recent symbolic regression methods
Patryk Orzechowski, William La Cava, Jason H. Moore 11:05-11:30

Program Synthesis using Uniform Mutation by Addition and Deletion
Thomas Helmuth, Nicholas Freitag McPhee, Lee Spector 11:30-11:55

Towards Automation & Augmentation of the Design of Schedulers for Cellular Communications Networks
Michael Fenton, David Fagan 10:40-11:05

Parameter-less (Meta)heuristics for Vehicle Routing Problems
Jakub Nalepa, Miroslaw Blocho 11:05-11:30

Summary of Evolutionary Computation for Wind Farm Layout Optimization
Better Runtime Guarantees Via Stochastic Domination (Hot-off-the-Press Track at GECCO 2018)
Benjamin Doerr 11:55-12:20

RWA4
Wednesday, July 18, 10:40-12:20, Training Room 3 (2F)
Chair: Thomas Bartz-Beielstein (TH Köln, SPOTSeven Lab)

A Rolling Window with Genetic Algorithm Approach to Sorting Aircraft for Automated Taxi Routing
Alexander Edward Ian Brownlee, John R. Woodward, Michal Weiszer, Jun Chen 10:40-11:05

Comparison of Parallel Surrogate-Assisted Optimization Approaches
Frederik Rehbach, Martin Zaefferer, Jörg Stork, Thomas Bartz-Beielstein 11:05-11:30

Surrogate assisted optimization of particle reinforced metal matrix composites
Lorenzo Gentile, Martin Zaefferer, Dario Giugliano, Haofeng Chen, Thomas Bartz-Beielstein 11:30-11:55

Rate-Setter: Roadmap for Faster, Safer, and Better Platform Train Interface Design and Operation using Evolutionary Optimization
David Fletcher, Rob Harrison, Twin Karmakharm, Paul Richmond, Samadhi Nallaperuma 11:55-12:20

SBSE1
Wednesday, July 18, 10:40-12:20, Conference Room A (3F)
Chair: Houari Sahraoui (DIRO, Univ. de Montreal)

Multi-Objective Black-Box Test Case Selection for Cost-Effectively Testing Simulation Models
Aitor Arrieta, Shuai Wang, Ainhoa Arruabarrena, Urtzi Markiegi, Goiuria Sagardui, Leire Etxeberria 10:40-11:05

Dependent Input Sampling Strategies: Using Metaheuristics for Generating Parameterised Random Sampling Regimes
Komsan Srivisut, John Andrew Clark, Richard Freeman Paige 11:05-11:30

Test suite minimization for mutation testing of WS-BPEL compositions
Francisco Palomo-Lozano, Inmaculada Medina-Bulo, Antonia Estero-Botaro, Manuel Núñez 11:30-11:55
ACO-SI2
Wednesday, July 18, 15:30-17:10, Conference Room B (3F)
Chair: Andries P. Engelbrecht (University of Pretoria)

A Particle Swarm Optimization based Feature Selection Approach to Transfer Learning in Classification
Bach Hoai Nguyen, Bing Xue, Peter Andreae 15:30-15:55

Using Ant Colony Optimization to Optimize Long Short-Term Memory Recurrent Neural Networks

Semi-supervised Learning Assisted Particle Swarm Optimization of Computationally Expensive Problems
Chaoli Sun, Yaochu Jin, Ying Tan 16:20-16:45

CS4
Wednesday, July 18, 15:30-17:10, AV Study Room (2F)
Chair: Emma Hart (Napier University)

Hierarchical Behavioral Repertoires with Unsupervised Descriptors
Antoine Cully, Yiannis Demiris 15:30-15:55

How swarm size during evolution impacts the behavior, generalizability, and brain complexity of animats performing a spatial navigation task
Dominik Fischer, Sanaz Mostaghim, Larissa Albantakis 15:55-16:20

Automatic Synthesis of Swarm Behavioural Rules from their Atomic Components
Dilini Samarasinghe, Erandi Lakshika, Michael Barlow, Kathryn Kasmarik 16:20-16:45

On an Immuno-inspired Distributed, Embodied Action-Evolution cum Selection Algorithm
Tushar Semwal, Divya D. Kulkarni, Shivashankar B. Nair 16:45-17:10

DETA2+THEORY3+GECH4: Best Papers
Wednesday, July 18, 15:30-17:10, Conference Room Medium (2F)
Chair: Per Kristian Lehre (University of Birmingham) (Best Paper nominees are marked with a star)

Evolving Mario Levels in the Latent Space of a Deep Convolutional Generative Adversarial Network ⭐
Vanessa Volz, Jacob Schrum, Jialin Liu, Simon M. Lucas, Adam M. Smith, Sebastian Risi 15:30-15:55

Domino Convergence: Why One Should Hill-Climb on Linear Functions ⭐
Carsten Witt 15:55-16:20

Working Principles of Binary Differential Evolution ⭐
Weijie Zheng, Guangwen Yang, Benjamin Doerr 16:20-16:45

On the Runtime Analysis of Selection Hyper-Heuristics with Adaptive Learning Periods
Benjamin Doerr, Andrei Lissovoi, Pietro S. Oliveto, John Alasdair Warwicker 16:45-17:10
ECOM5
Wednesday, July 18, 15:30-17:10, Conference Room 2 (3F)
Chair: Gabriela Ochoa (University of Stirling)

A fitness landscape analysis of the Travelling Thief Problem

Algorithm Selection on Generalized Quadratic Assignment Problem Landscapes
Andreas Beham, Stefan Wagner, Michael Affenzeller 15:55-16:20

Fitness Landscape Analysis around the Optimum in Computational Protein Design
David Simoncini, Sophie Barbe, Thomas Schiex, Sébastien Verel 16:20-16:45

Multifractality and Dimensional Determinism in Local Optima Networks
Sarah Louise Thomson, Sébastien Verel, Gabriela Ochoa, Nadarajen Veerapen, David Cairns 16:45-17:10

EML5
Wednesday, July 18, 15:30-17:10, Training Room 2 (2F)
Chair: Satoshi Ono (Kagoshima University)

Evolutionary Architecture Search for Deep Multitask Networks
Jason Zhi Liang, Elliot Meyerson, Risto Miikkulainen 15:30-15:55

Memetic Evolution of Deep Neural Networks
Pablo Ribalta Lorenzo, Jakub Nalepa 15:55-16:20

Optimizing Floating Centroids Method Neural Network Classifier Using Dynamic Multilayer Particle Swarm Optimization
Changwei Cai, Shuangrong Liu, Lin Wang, Bo Yang, Zhenxiang Chen, Jin Zhou 16:20-16:45

EMO6
Wednesday, July 18, 15:30-17:10, Conference Room D (3F)
Chair: Bogdan Filipic (Jozef Stefan Institute, Jozef Stefan International Postgraduate School)

Local Search Effects in Bi-Objective Orienteering

Interactive Multiobjective Optimisation: Preference Changes And Algorithm Responsiveness
Kendall Peter Taylor, Xiaodong Li 15:55-16:20

Preference-based 3-Dimensional En-route Airspace Sectorization
Cheryl Sze Yin Wong, Suresh Sundaram 16:20-16:45

GA4: Best Papers
Wednesday, July 18, 15:30-17:10, Terrsa Hall (1F)
Chair: Tian-Li Yu (Department of Electrical Engineering, National Taiwan University; National Taiwan Uni-
Runtime Analysis of Probabilistic Crowding and Restricted Tournament Selection for Bimodal Optimisation
Edgar Covantes Osuna, Dirk Sudholt 15:30-15:55

Tunneling Between Plateaus: Improving on a State-of-the-Art MAXSAT Solver using Partition Crossover
Wenxiang Chen, Darrell D. Whitley, Francisco Chicano, Renato Tinós 15:55-16:20

Learning Bayesian Network Structures with GOMEA
Kalisa Orphanou, Dirk Thierens, Peter A.N. Bosman 16:20-16:45

Fast Algorithm for Fair Comparison of Genetic Algorithms
Chia-Sheng Chen, Hung-Wei Hsu, Tian-Li Yu 16:45-17:10

Approximating Complex Arithmetic Circuits with Formal Error Guarantees: 32-bit Multipliers Accomplished
Milan Češka, Jiří Matyáš, Vojtech Mrazek, Lukas Sekanina, Zdenek Vasicek, Tomas Vojnar 15:30-15:55

Energy-consumption prediction of Genetic Programming Algorithms using a Fuzzy Rule-Based System
Francisco Chavez de la O, Francisco Fernandez de Vega, Josefà Díaz-Alvarez, Juan A. García, Francisco J. Rodríguez, Pedro A. Castillo 15:55-16:20

Evolutionary Computation: An Investigation of Parameter Space
Moshe Sipper, Weixuan Fu, Karuna Ahuja, Jason H. Moore 16:20-16:45

Deep Statistical Comparison of Meta-heuristic Stochastic Optimization Algorithms
Tome Eftimov, Peter Korošec, Barbara Koroušić Seljak 16:45-17:10

Investigation of the Latent Space of Stock Market Patterns with Genetic Programming
Sungjoo Ha, Sängeop Lee, Byung-Ro Moon 15:30-15:55

Value-Based Manufacturing Optimisation in Serverless Clouds for Industry 4.0
Piotr Dzurzanski, Jerry Swan, Leandro Soares Indrusiak 15:55-16:20

Impacts of Constraints and Constraint Handling Strategies for Multi-Objective Mechanical Design Problems
Cyril Picard, Jürg Schiffmann 16:20-16:45
Optimizing Residential Energy Resources with an Improved Multi-Objective Genetic Algorithm based on Greedy Mutations
Ivo Gonçalves, Álvaro Gomes, Carlos Henggeler Antunes 16:45-17:10

SBSE2
Wednesday, July 18, 15:30-17:10, Conference Room A (3F)
Chair: Giuliano Antoniol (Ecole Polytechnique de Montreal)

On the Effects of Seeding Strategies: A Case for Search-based Multi-Objective Service Composition
Tao Chen, Miqing Li, Xin Yao 15:30-15:55

A Novel Fitness Function for Automated Program Repair Based on Source Code Checkpoints
Eduardo Faria de Souza, Celso Gonçalves Camilo-Junior, Claire Le Goues 15:55-16:20

Towards the Automated Recovery of Complex Temporal API-Usage Patterns
Mohamed Aymen Saied, Houari Sahraoui, Edouard Batot, Michalis Famelis, Pierre-Olivier Talbot 16:20-16:45
### DETA3
Thursday, July 19, 09:00-10:40, Conference Room 2 (3F)
Chair: Jacob Schrum (Department of Mathematics and Computer Science, Southwestern University)

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<th>Title</th>
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<tbody>
<tr>
<td>Querying Across Time to Interactively Evolve Animations</td>
<td>Isabel Tweraser, Lauren E. Gillespie, Jacob Schrum</td>
<td>09:00-09:25</td>
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<tr>
<td>Generating a Melody Based on Symbiotic Evolution for Musicians’ Creative Activities</td>
<td>Noriko Otani, Daisuke Okabe, Masayuki Numao</td>
<td>09:25-09:50</td>
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### EML6
Thursday, July 19, 09:00-10:40, Training Room 2 (2F)
Chair: Josh Bongard (University of Vermont)

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<tr>
<td>Ensembles of Evolved Nested Dichotomies for Classification</td>
<td>Marcel Wever, Felix Mohr, Eyke Hüllermeier</td>
<td>09:00-09:25</td>
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<td>Efficient Sample Reuse in Policy Search by Multiple Importance Sampling</td>
<td>Eiji Uchibe</td>
<td>09:25-09:50</td>
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<tr>
<td>Online Meta-Learning by Parallel Algorithm Competition</td>
<td>Stefan Elfwing, Eiji Uchibe, Kenji Doya</td>
<td>09:50-10:15</td>
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<tr>
<td>Evolutionary Expectation Maximization</td>
<td>Enrico Guiraud, Jakob Drefs, Jörg Lücke</td>
<td>10:15-10:40</td>
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### EML7
Thursday, July 19, 09:00-10:40, Conference Room B (3F)
Chair: Grant Dick (University of Otago, Information Science Dept.)

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<th>Title</th>
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<tbody>
<tr>
<td>Automatically Evolving Difficult Benchmark Feature Selection Datasets with Genetic Programming</td>
<td>Andrew Lensen, Bing Xue, Mengjie Zhang</td>
<td>09:00-09:25</td>
</tr>
<tr>
<td>CovSel: A New Approach for Ensemble Selection Applied to Symbolic Regression Problems</td>
<td>Dominik Sobania, Franz Rothlauf</td>
<td>09:25-09:50</td>
</tr>
<tr>
<td>Limited Evaluation Cooperative Co-evolutionary Differential Evolution for Large-scale Neuroevolution</td>
<td>Anil Yaman, Decebal Constantin Mocanu, Giovanni Iacca, George Fletcher, Mykola Pechenizkiy</td>
<td>09:50-10:15</td>
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</tbody>
</table>

### EMO7: Best Papers
Thursday, July 19, 09:00-10:40, Terrsa Hall (1F)
Chair: Tea Tusar (Jozef Stefan Institute) *(Best Paper nominees are marked with a star)*
Efficient Search Techniques Using Adaptive Discretization of Design Variables on Real-Coded Evolutionary Computations
Toshiki Kondo, Tomoaki Tatsukawa 09:00-09:25

Multi-Objective Evolutionary Hyper-heuristic based on Multiple Indicator-based Density Estimators☆
Jesús Guillermo Falcón-Carolina, Carlos A. Coello Coello 09:25-09:50

A new R2 indicator for better hypervolume approximation☆
Ke Shang, Hisao Ishibuchi, Min-Ling Zhang, Yiping Liu 09:50-10:15

Data-Driven Analysis of Pareto Set Topology☆
Naoki Hamada, Keisuke Goto 10:15-10:40

ENUM4: Best Papers
Thursday, July 19, 09:00-10:40, Conference Room Medium (2F)
Chair: Nikolaus Hansen (Inria, research centre Saclay) (Best Paper nominees are marked with a star)

PSA-CMA-ES: CMA-ES with Population Size Adaptation☆
Kouhei Nishida, Youhei Akimoto 09:00-09:25

An Empirical Comparison of Metamodeling Strategies in Noisy Environments☆
Sunith Bandaru, Amos H.C. Ng 09:25-09:50

Performance Improvements for Evolutionary Strategy-based One-Class Constraint Synthesis
Tomasz P. Pawlak 09:50-10:15

HOP3
Thursday, July 19, 09:00-10:40, Conference Room C (3F)
Chair: William LaCava (University of Massachusetts Amherst)

Constraint Handling Guided by Landscape Analysis in Combinatorial and Continuous Search Spaces
Katherine Malan, Irene Moser 09:00-09:25

A multidimensional genetic programming approach for identifying epistatic gene interactions
William La Cava, Sara Silva, Kourosh Danai, Leonardo Vanneschi, Jason H. Moore, Lee Spector 09:25-09:50

On Botnet Detection with Genetic Programming under Streaming Data, Label Budgets and Class Imbalance

Standard Steady State Genetic Algorithms Can Hillclimb Faster than Evolutionary Algorithms using Standard Bit Mutation
Dogan Corus, Pietro S. Oliveto 10:15-10:40

HOP4
Thursday, July 19, 09:00-10:40, Conference Room D (3F)
Chair: Krzysztof Michalak (Wroclaw University of Economics)
Employing Multi-Objective Search to Enhance Reactive Test Generation and Prioritization for Testing Industrial Cyber-Physical Systems
Aitor Arrieta, Shuai Wang, Urtzi Markiegi, Goiuria Sagardui, Leire Etxeberria 09:00-09:25

Detection of Minimum Biomarker Features via Bi-level Optimization Framework by Nested Hybrid Differential Evolution
Kai-Cheng Hsu, Feng-Sheng Wang 09:25-09:50

ED-LS - A Heuristic Local Search for the Firefighter Problem
Krzysztof Michalak 09:50-10:15

A GA based Network Optimization Tool for Passive In-Building Distributed Antenna Systems
Siddhartha Shakya, Kin Poon, Anis Ouali 09:00-09:25

Genetic Algorithm to Study Practical Quantum Adversaries
Walter O. Krawec, Sam A. Markelon 09:25-09:50

Functional Generative Design: An Evolutionary Approach to 3D-Printing
Cem C. Tutum, Supawit Chockchowwat, Etienne Vouga, Risto Miikkulainen 09:50-10:15

Estimation of the Heterogeneous Strategies from Action Log
Keiichi Namikoshi, Sachiyu Arai 10:15-10:40

Evolving the Autosteering of a Car Featuring a Realistically Simulated Steering Response
Vsevolod Nikulin, Albert Podusenko, Ivan Tanev, Katsunori Shimohara 09:00-09:25

Orthogonalization of Linear Representations for Efficient Evolutionary Design Optimization
Andreas Richter, Stefan Dresselhaus, Stefan Menzel, Mario Botsch 09:25-09:50

Predicting Friction System Performance with Symbolic Regression and Genetic Programming with Factor Variables
Gabriel Kronberger, Michael Kommenda, Andreas Promberger, Falk Nickel 09:50-10:15

Multi-Objective Aerodynamic Design with User Preference using Truncated Expected Hypervolume Improvement
Pramudita Satria Palar, Kaifeng Yang, Koji Shimoyama, Michael Emmerich, Thomas Bäck 10:15-10:40

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THEORY4
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Chair: Anne Auger (INRIA; CMAP, Ecole Polytechnique)
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<td>Chao Qian, Chao Bian, Yang Yu, Ke Tang, Xin Yao</td>
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<td>On the Robustness of Evolutionary Algorithms to Noise: Refined Results and an Example Where Noise Helps</td>
<td>Dirk Sudholt</td>
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<td>Runtime Analysis of Randomized Search Heuristics for the Dynamic Weighted Vertex Cover Problem</td>
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ACO-SI — Ant Colony Optimization and Swarm Intelligence

Multiple Swarm Intelligence Methods based on Multiple Population with Sharing Best Solution for Drastic Environmental Change
Yuta Umenai, Fumito Uwano, Hiroyuki Sato, Keiki Takadama

Particle Swarm and Population Structure
Carlos M. Fernandes, Nuno Fachada, Juan L.J. Laredo, Agostinho C. Rosa, JJ Merelo

Artificial Bee Colony Algorithm based on Adaptive Local Information Sharing: Approach for several dynamic changes
Ryo Takano, Hiroyuki Sato, Keiki Takadama

Comparative Performance and Scaling for the Pareto Improving Particle Swarm Algorithm
Stephyn G. W. Butcher, John Sheppard, Brian Haberman

Improving the Accuracy of 2D-3D Registration of Femur Bone for Bone Fracture Reduction Robot using Particle Swarm Optimization
Asaduz Zaman, Seong Young Ko

Gaussian Bare-bones Cuckoo Search Algorithm
Hu Peng, Changshou Deng, Hui Wang, Wenjun Wang, Xinyu Zhou, Zhijian Wu

Scouting Strategy for Biasing Fireworks Algorithm Search to Promising Directions
Jun Yu, Ying Tan, Hideyuki Takagi

Multimodal Optimization of Traveling Salesman Problem: A Niching Ant Colony System
Xing-Chi Han, Hao-Wen Ke, Yue-Jiao Gong, Ying Lin, Wei-Li Liu, Jun Zhang

Comparative Study on Discrete SI Approaches to the Graph Coloring Problem
Claus Aranha, Jair Pereira Junior, Hitoshi Kanoh

An Efficient Ant Colony System For Coverage Based Test Case Prioritization
Chengyu Lu, Jinghui Zhong

Inverted Ant Colony Optimization for Search and Rescue in an Unknown Maze-like Indoor Environment
Zainab Husain, Dymitr Ruta, Fabrice Saffre, Yousof Al-Hammadi, Abdel F. Isakovic

ComplIoT — Competition Entries

Anomaly Detection for Drinking Water Quality via Deep BiLSTM Ensemble
Xingguo Chen, Fan Feng, Jikai Wu, Wenyu Liu

Online Anomaly Detection for Drinking Water Quality Using a Multi-objective Machine Learning Approach
Victor Henrique Alves Ribeiro, Gilberto Reynoso Meza

Automatic vs. Manual Feature Engineering for Anomaly Detection of Drinking-Water Quality
Valerie Aenne Nicola Fehst, Huu Chuong La, Tri-Duc Nghiem, Ben E. Mayer, Paul Englert, Karl-Heinz Fiebig
CS — Complex Systems

Open-Ended Evolution with Multi-Containers QD
  Stephane Doncieux, Alexandre Coninx

The Dynamics of Cooperation versus Competition
  Geoff Nitschke, Olaf Witkowski

Toward Learning Neural Network Encodings for Continuous Optimization Problems
  Eric O. Scott, Kenneth De Jong

Evolutionary Hexapod Robot Gait Control Using A New Recurrent Neural Network Learned Through Group-based Hybrid Metaheuristic Algorithm
  Chia-Feng Juang, Yu-Cheng Chang, I-Fang Chung

Policy Transfer Methods in RoboCup Keep-Away
  Geoff Nitschke

Meta-Learning by the Baldwin Effect
  Chrisantha Fernando, Jakub Sygnowski, Simon Osindero, Jane Wang, Tom Schaul, Denis Teplyashin, Pablo Sprechmann, Alexander Pritzel, Andrei Rusu

Embodiment can combat catastrophic forgetting
  Joshua P. Powers, Josh C. Bongard, Sam Kriegman

A Distributed Dendritic Cell Algorithm for Big Data
  Zaineb Chelly Dagdia

Bend and Flex: Passive Flexibility or Active Control in a Quadruped Animat
  Jared M. Moore, Anthony J. Clark

Ecological Theory Provides Insights about Evolutionary Computation
  Emily L. Dolson, Charles Ofria

Why Don’t the Modules Dominate?
  Zhenyue Qin, Robert McKay, Tom Gedeon

DETA — Digital Entertainment Technologies and Arts

Silhouette-based Three Dimensional Image Registration Using CMA-ES with Joint Scheme of Partial Restart and Variable Fixing
  Takuto Shigenobu, Takuya Ushinohama, Hiroshi Kawasaki, Satoshi Ono

Hybrid Fighting Game AI using Genetic Algorithm and Monte Carlo Tree Search
  Man-Je Kim, Chang Wook Ahn

A Proposal for Distributed Interactive Differential Evolution -In A Case of Creating Sign Sounds for Multiple Users
  Makoto Fukumoto, Kota Nomura

Collaborative Interactive Evolution in Minecraft
  Pablo González de Prado Salas, Sebastian Risi

Towards an experiment on perception of affective music generation using MetaCompose
  Marco Scirea, Sebastian Risi, Julian Togelius, Peter Eklund
ECOM — Evolutionary Combinatorial Optimization and Metaheuristics

EDA-Based Approach to Comprehensive Quality-Aware Automated Semantic Web Service Composition  
Chen Wang, Hui Ma, Gang Chen

Genetic Programming Hyper-Heuristic for Multi-Vehicle Uncertain Capacitated Arc Routing Problem  
Yi Mei, Mengjie Zhang

An Energy-Efficient Single Machine Scheduling with Release Dates and Sequence-Dependent Setup Times  
M. Fatih Tasgetiren, Ugur Eliiyi, Hande Öztöp, Damla Kızılay, Quan-Ke Pan

Distance-based Exponential Probability Models on Constrained Combinatorial Optimization Problems  
Josu Ceberio, Alexander Mendiburu, Jose Antonio Lozano

Relating Training Instances to Automatic Design of Algorithms for Bin Packing via Features  
Alexander Edward Ian Brownlee, John R. Woodward, Nadarajen Veerapen

Local Intensity in Memetic Algorithm: Case Study in CARP  
Zhi-Wei Zeng, Xiao-Min Hu, Min Li, Yu Luo

A Histogram Estimation of Distribution Algorithm for Resource Scheduling  
Li-Tao Tan, Wei-Neng Chen, Jun Zhang

An Efficient Approximation to the Barrier Tree Using the Great Deluge Algorithm  
Hansang Yun, Byung-Ro Moon

Feature Construction in Genetic Programming Hyper-heuristics for Dynamic Flexible Job Shop Scheduling  
Daniel Yska, Yi Mei, Mengjie Zhang

A Network Design Problem with Location, Inventory and Routing Decisions  
Onur Kaya, Dogus Ozkok

EML — Evolutionary Machine Learning

Reinforcement Learning for Evolutionary Distance Metric Learning Systems Improvement  
Bassel Ali, Wasin Kalintha, Koichi Moriyama, Masayuki Numao, Ken-ichi Fukui

A Neuroevolution Strategy Using Multi-agent Incorporated Hierarchical Ensemble Model  
Kuan-Wu Su, Min-Chieh Yu, Jenq-Shiou Leu

Neuroevolution under Unimodal Error Landscapes: An Exploration of the Semantic Learning Machine Algorithm  
Jan-Benedikt Jagusch, Ivo Gonçalves, Mauro Castelli

Clustering sensory inputs using NeuroEvolution of Augmenting Topologies  
David Kadish

Learning How to Flock: Deriving Individual Behaviour from Collective Behaviour with Multi-Agent Reinforcement Learning and Natural Evolution Strategies  
Koki Shimada, Peter Bentley

Building Boosted Classification Tree Ensemble with Genetic Programming  
Sašo Karakatič, Vili Podgorelec

Confidence-Based Ensemble Modeling in Medical Data Mining
Lukas Kammerer, Michael Affenzeller

**Accelerating the Evolution of Convolutional Neural Networks with Node-Level Mutations and Epigenetic Weight Initialization**
Travis Desell

**Multiobjective Optimization based Subspace Clustering using Evolvable Genome structure**
Dipanjoyt Paul, Sriparna Saha, Jimson Mathew

**A Study of Automatic Clustering Based on Evolutionary Many-objective Optimization**
Shuwei Zhu, Lihong Xu, Leilei Cao

**EMO — Evolutionary Multiobjective Optimization**

**Proposal of Benchmark Problem Based on Real-World Car Structure Design Optimization**
Takehisa Kohira, Hiromasa Kemmotsu, Oyama Akira, Tomoaki Tatsukawa

**Modeling dependencies between decision variables and objectives with copula models**
Abdelhakim Cheriet, Roberto Santana

**Introducing a Linkage Identification Considering non-Monotonicity to Multi-objective Evolutionary Optimization with Decomposition for Real-valued Functions**
Kousuke Izumiya, Masaharu Munetomo

**An Efficient Nondominated Sorting Algorithm**
Junchen Wang, Changhe Li, Yiya Diao, Sanyou Zeng, Hui Wang

**An analysis of epsilon-lexicase selection for large-scale many-objective optimization**
William La Cava, Jason H. Moore

**Studying the Effect of Techniques to Generate Reference Vectors in Many-objective Optimization**
Miriam Pescador-Rojas, Carlos A. Coello Coello

**Trust-region based Algorithms with Low-budget for Multi-objective Optimization**
Proteek Chandan Roy, Julian Blank, Rayan Hussein, Kalyanmoy Deb

**Visualization of The Boundary Solutions of High Dimensional Pareto Front from A Decision Maker’s Perspective**
AKM Khaled Ahsan Talukder, Kalyanmoy Deb, Julian Blank

**Accelerating a multi-objective memetic algorithm for feature selection using hierarchical k-means indexes**
Francia Jiménez, Claudio Sanhueza, Regina Berretta, Pablo Moscato

**Balancing Exploration and Exploitation in Multiobjective Evolutionary Optimization**
Jianyong Sun, Hu Zhang, Qingfu Zhang, Huanhuan Chen

**Preference-based Evolutionary Algorithms for Many-Objective Mission Planning of Agile Earth Observation Satellites**
Longmei Li, Hao Chen, Jing Wu, Jun Li, Ning Jing, Michael Emmerich

**Bilevel Innovization: Knowledge Discovery in Scheduling Systems using Evolutionary Bilevel Optimization and Visual Analytics**
Julian Schulte, Niclas Feldkamp, Sören Bergmann, Volker Nissen

**Studying MOEAs Dynamics and their Performance using a Three Compartmental Model**
Hugo Monzón, Hernán Aguirre, Sébastien Verel, Arnaud Liefooghe, Bilel Derbel, Kiyoshi Tanaka

**On Asynchronous Non-Dominated Sorting for Steady-State Multiobjective Evolutionary Algorithms**
Ilya Yakupov, Maxim Buzdalov

**Pareto dominance-based MOEAs on Problems with Difficult Pareto Set Topologies**
Yuri Marca, Hernán Aguirre, Saúl Zapotecas, Arnaud Liefooghe, Bilel Derbel, Sébastien Verel, Kiyoshi Tanaka

**Benchmarking Multiobjective Evolutionary Algorithms and Constraint Handling Techniques on a Real-World Car Structure Design Optimization Benchmark Problem**
Hiroaki Fukumoto, Akira Oyama

**ENUM — Evolutionary Numerical Optimization**

**Niching an Archive-based Gaussian Estimation of Distribution Algorithm via Adaptive Clustering**
Yongsheng Liang, Zhigang Ren, Bei Pang, An Chen

**Enhancing Cooperative Coevolution for Large Scale Optimization by Adaptively Constructing Surrogate Models**
Bei Pang, Zhigang Ren, Yongsheng Liang, An Chen

**Investigating Benchmarks for Comparing Algorithms with Parameter Tuning**
Lee Ashley Christie, Alexander Edward Ian Brownlee, John R. Woodward

**An adapting population size approach in the CMA-ES for multimodal functions**
Duc Manh Nguyen

**A study of similarity measure between tasks for multifactorial evolutionary algorithm**
Lei Zhou, Liang Feng, Jinghui Zhong, Zexuan Zhu, Bingshui Da, Zhou Wu

**A Note on the CMA-ES for Functions with Periodic Variables**
Takahiro Yamaguchi, Youhei Akimoto

**Accelerating Differential Evolution Using Multiple Exponential Cauchy Mutation**
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**Dynamic Constrained Multi-objective Evolutionary Algorithms with A Novel Selection Strategy for Constrained Optimization**
Ruwang Jiao, Sanyou Zeng, Changhe Li, Yuhong Jiang

**Multi-Fidelity Surrogate Model Approach to Optimization**
Sander van Rijn, Sebastian Schmitt, Markus Olhofer, Matthijs van Leeuwen, Thomas Bäck

**Exploratory Landscape Analysis Using Algorithm Based Sampling**
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**Multipopulation Evolution Framework for Multifactorial Optimization**
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**A Modern, Event-Based Architecture For Distributed Evolutionary Algorithms**
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**Genetic optimisation of BCI systems for identifying games related cognitive states**
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A Comparative Study on Algorithms for Influence Maximization in Social Networks
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The influence of fitness caching on modern evolutionary methods and fair computation load measurement
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Using Genetic Algorithms based on Neighbor List Mechanism to Reduce Handover Latency for IEEE 802.11 WLAN
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GECH — General Evolutionary-Computation and Hybrids

Towards Management of Complex Modeling through a Hybrid Evolutionary Identification
Sergey V. Kovalchuk, Oleg G. Metsker, Anastasia A. Funkner, Ilia O. Kisliakovskii, Nikolai O. Nikitin, Anna V. Kalyuzhnaya, Klavdiya O. Bochenina, Danila A. Vaganov

A Hybrid Differential Evolution and Estimation of Distribution Algorithm for the Multi-Point Dynamic Aggregation Problem
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Heterogeneous Island Model with Re-planning of Methods
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Ranking Empirical Cumulative Distribution Functions using Stochastic and Pareto Dominance
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Preselection via One-class Classification for Evolutionary Optimization
Jinyuan Zhang, Aimin Zhou, Guixu Zhang

An Evolutionary Algorithm with A New Operator and An Adaptive Strategy for Large-Scale Portfolio Problem
Yi Chen, Aimin Zhou, Liang Dou

Voronoi-Based Archive Sampling for Robust Optimisation
Kevin Doherty, Khulood Alyahya, Jonathan E. Fieldsend, Ozgur E. Akman

Crowding Distance based Promising Solution Selection in Surrogate Assisted Asynchronous Multi-Objective Evolutionary Algorithm
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GP — Genetic Programming

Analyzing Effects of Various Trust in Product Recalls Using a Social Simulation with a Co-Evolution Model
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Exploring the Application of GOMEA to Bit-string GE  
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On the Effect of Function Set to the Generalisation of Symbolic Regression Models  
Miguel Nicolau, Alexandros Agapitos

Evolving PSO Algorithm Design in Vector Fields Using Geometric Semantic GP  
Palina Bartasheviich, Illya Bakurov, Sanaz Mostaghim, Leonardo Vanneschi

Multi-Population Genetic Programming with Adaptively Weighted Building Blocks for Symbolic Regression  
Zhixing Huang, Jinghui Zhong, Wei-Li Liu, Zhou Wu

RWA — Real World Applications

Estimating Parameters for a Dynamical Dengue Model Using Genetic Algorithms  
Joshua Uyheng, John Clifford Rosales, Kennedy Espina, Ma. Regina Justina Estuar

Evolving Imaging Model for Super-Resolution Reconstruction  
Michal Kawulok, Pawel Benecki, Daniel Kostrzewa, Lukasz Skonieczny

Massively Parallelized Co-evaluation for Many-Objective Space Trajectory Optimization  
Martin Schlueter, Masaharu Munetomo

Towards a Small Diverse Pareto-optimal Solutions Set Generator for Multiobjective Optimization Problems  
Courtney Ricardo Powell, Katsunori Miura, Masaharu Munetomo

Discovering Pareto-optimal Process Models: A Comparison of MOEA Techniques  
Sonia Kundu, Manoj Agarwal, Shikha Gupta, Naveen Kumar

Competitive Coevolutionary Algorithm Decision Support  
Daniel Prado Sánchez, Marcos A. Perttierra, Erik Hemberg, Una-May O'Reilly

Genetic Algorithm based Sleep Scheduling for Maximizing Lifetime of Wireless Sensor Networks  
Jingjing Li, Zhipeng Luo

Using Ensemble Modeling to Determine Causes of Multifactorial Disorders  
Ian Rogers, Ranjan Srivastava

Evolutionary Multi-objective Air-Conditioning Schedule Optimization for Office Buildings  
Yoshihiro Ohta, Hiroyuki Sato

SIALAC Benchmark: On the design of adaptive algorithms for traffic lights problems  
Florian Leprêtre, Cyril Fonlupt, Sébastien Verel, Virginie Marion

An Optimization Study of Screw Position and Number of Screws for the Fixation Stability of a Distal Femoral Locking Compression Plate Using Genetic Algorithms  
Ching-Chi Hsu, Chian-Her Lee, Sung-Ming Hsu

Performance Assessment of a Modified Multi-objective Cuckoo’s Search Algorithm for Microgrid Planning considering uncertainties
Andrés Felipe Acosta León, Sergio Felipe Contreras Paredes, Camilo Andrés Cortés Guerrero

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Raymond Chiong, Zongwen Fan, Zhongyi Hu, Marc T.P. Adam, Bernhard Lutz, Dirk Neumann

A Novel Genetic Algorithm for Lifetime Maximization of Wireless Sensor Networks with Adjustable Sensing Range
Zihui Wu, Ying Lin, Yue-Jiao Gong, Zhengjia Dai, Jun Zhang

Total Optimization of Smart City by Global-best Brain Storm Optimization
Mayuko Sato, Yoshikazu Fukuyama

Natural Evolution Tells us How to Best Make Goods Delivery: Use Vans
Daniel H. Stolfi, Christian Cintrano, Francisco Chicano, Enrique Alba

Evolutionary Design of Large Approximate Adders Optimized for Various Error Criteria
Vojtech Mrazek, Zdenek Vasichek

Improving Greenhouse Control Using Crop-Model-Driven Multi-Objective Optimization
José R. Llera, Erik D. Goodman, Erik S. Runkle, Lihong Xu

Autonomous Deployment of Mobile Sensors Network in an Unknown Indoor Environment with Obstacles
Khouloud Elediebi, Dymitr Ruta, Fabrice Saffre, Yousof Alhammadi, Abdel F. Isakovic

SBSE — Search-Based Software Engineering

A Dynamic Fitness Function for Search Based Software Testing
Xiong Xu, Li Jiao, Ziming Zhu

Search-based mutation testing to improve performance tests
Ana B. Sánchez, Pedro Delgado-Pérez, Inmaculada Medina-Bulo, Sergio Segura

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Farshad Ghassemi Toosi, Asanka Wasala, Goetz Botterweck, Jim Buckley

Solving Team Making Problem for Crowdsourcing with Hybrid Metaheuristic Algorithm
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Bayesian Inference for Algorithm Ranking Analysis
Borja Calvo, Josu Ceberio, Jose Antonio Lozano

Better Fixed-Arity Unbiased Black-Box Algorithms
Nina Bulanova, Maxim Buzdalov

A Parameterized Runtime Analysis of Randomized Local Search and Evolutionary Algorithm for Max l-Uncut
Pallavi Jain, Lawqueen Kanesh, Jayakrishnan Madathil, Saket Saurabh
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