

SIGEVOLution

newsletter of the ACM Special Interest Group on Genetic and Evolutionary Computation

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Issue 4

GECCO



in this issue

GECCO 2016

PPSN 2016

2016



Guest Editorial (from Frank Neumann, General Chair, GECCO 2016)

The Genetic and Evolutionary Computation Conference (GECCO) 2016 will take place in Denver, Colorado, USA, July 20-24. GECCO is sponsored by the Association for Computing Machinery (ACM) Special Interest Group on Genetic and Evolutionary Computation (SIGEVO). It is the top quality conference in the area of evolutionary computation ensuring excellent quality by a selective reviewing process. Decisions on the acceptance of papers are made by expert track chairs handling the different areas of evolutionary computation. This ensure a high quality reviewing process making sure that only the best work in the different areas of evolutionary computation gets accepted and presented at this leading conference.

This year 381 papers were submitted to 15 different tracks, and 1740 reviews assigned. Approximately 36% of papers have been accepted as full papers, with a further 32% accepted for poster presentation. Please register soon to ensure that you don't miss these outstanding technical paper and poster presentations and the invited keynote presentations by Bernard Chazelle (Princeton) and Holger H. Hoos (University of British Columbia).

Attending GECCO gives an unparalleled opportunity to catch up with the leading experts in the field, establish new collaborations, and also enjoy your pick from 17 free workshops and 32 free tutorials. You can also take part in one or more of the 5 competitions being run, and there is still time to submit your entry to the annual Humies event, with awards totalling \$10,000 up for grabs.

We are looking forward to seeing everyone in Denver at GECCO2016. Students should note that a number of travel awards are available, with applications being accepted until April 21st. In addition, ACM-W provides support for women undergraduate and graduate students in Computer Science and related programs to attend research conferences. This exposure to the CS research world can encourage a student to continue on to the next level (Undergraduate to Graduate, Masters to Ph.D., Ph.D. to an industry or academic position). Applications can be submitted online until April 15th.

All the information you need is available at <http://gecco-2016.sigevo.org>

Frank Neumann
General Chair

LOCAL INFORMATION

About the Conference Venue

Denver is the capital and most populous municipality of the U.S. state of Colorado. This city is an important industrial center, a major destination for business travel, and a good base for trips into the Rockies.



Denver is nicknamed the Mile-High City because its official elevation is exactly one mile above sea level, making it one of the highest major cities in the United States.

The city has an agreeable continental climate, with plenty of sunshine and low rainfall. 300 days of sunshine, a thriving cultural scene, diverse neighborhoods, and natural beauty combine for the world's most spectacular playground.

Conference Hotel

The conference will take place in **Hyatt Regency Denver Tech Center**. There will be a special rate for conference participants (\$149 per night + tax).

For reservations, please click here: <https://aws.passkey.com/event/14007640/owner/2094/home>

REGISTRATION

Registration Type	Advance (by April 28)	Late (April 29 - July 19)	Onsite (After July 19)
ACM / SIGEVO Member	\$725	\$825	\$850
Non-Member	\$825	\$925	\$950
Student or Retired ACM/SIGEVO Member	\$305	\$375	\$475
Student or Retired Non-member	\$405	\$475	\$575

*****Please note, all fees are in U.S. Dollars*****

Register for GECCO 2016 here:

<https://www.regonline.com/Register/Checkin.aspx?EventID=1826931>

COMPETITIONS

Competitions demonstrate how Evolutionary Computation and related techniques can be utilized in challenging practical, real-world and gaming settings. They also enable fair comparisons between algorithms and (for recurrent competitions) provide the possibility to follow the development of approaches over time.

This year we have 6 different competitions, most of them are optimization-based.

1. Black Box Optimization Competition
2. Combinatorial Black Box Optimization Competition (CBBOC)
3. Industrial Challenge: Intelligent Data Analysis
4. Niching Methods for Multimodal Optimization
5. Virtual Creatures
6. Wind Farm Layout Optimization Competition

Full details of the competitions are available here:

<http://gecco-2016.sigevo.org/index.html/Competitions>

TUTORIALS

Tutorials will be presented by domain experts to cover current topics relevant to evolutionary computation researchers and practitioners. The tutorials range from introductory tutorials to advanced and specialized tutorials. Tutorials are free to all GECCO attendees.

Full details of all tutorials available here:
<http://gecco-2016.sigev.org/index.html/Tutorials>

1. **Complex Networks**
Marco Tomassini.
2. **Evolutionary Computation: A Unified Approach**
Kenneth A. De Jong.
3. **Evolutionary Multiobjective Optimization**
Dimo Brockhoff, Tobias Wagner.
4. **Evolving Neural Networks**
Risto Miikkulainen.
5. **Genetic Programming**
Una-May O'Reilly.
6. **Hyper-heuristics**
John R. Woodward, Daniel R. Tauritz.
7. **Introducing Rule-based Machine Learning: Capturing Complexity**
Ryan Urbanowicz.
8. **Introduction to Randomized Continuous Optimization (NEW)**
Youhei Akimoto, Nikolaus Hansen, Anne Auger.
9. **Introductory Statistics for EC: A Visual Approach (NEW)**
Mark Wineberg.
10. **Model-Based Evolutionary Algorithms**
Dirk Thierens, Peter A.N. Bosman.
11. **Representations for Evolutionary Algorithms**
Franz Rothlauf.
12. **Runtime Analysis of Population-based Evolutionary Algorithms (NEW)**
Per Kristian Lehre, Pietro S. Oliveto.
13. **Theory for No- Theoreticians (NEW)**
Benjamin Doerr, Carola Doerr.

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1. Biased Random-Key Genetic Algorithms (**NEW**)
Mauricio Resende, Celso Ribeiro.
2. Blind No More: Deterministic Mutation and Recombination Operators for Evolutionary Algorithms and Local Search
Darrell Whitley.
3. CMA-ES and Advanced Adaptation Mechanisms (**NEW**)
Youhei Akimoto, Anne Auger, Nikolaus Hansen.
4. Constraint-Handling Techniques used with Evolutionary Algorithms
Carlos Artemio Coello.
5. Expressive Genetic Programming: Concepts and applications
Lee Spector, Nic McPhee.
6. Generative and Developmental Systems
Kenneth Stanley.
7. Semantic Genetic Programming
Alberto Moraglio, Krzysztof Krawiec.
8. Simulation Optimization (**NEW**)
Jürgen Branke.
9. Solving complex problems with coevolutionary algorithms
Krzysztof Krawiec, Malcolm Heywood.
10. Theory of Swarm Intelligence
Dirk Sudholt.
11. Visualization in Multiobjective Optimization (**NEW**)
Bogdan Filipic, Tea Tušar.

1. Automatic (Offline) Configuration of Algorithms
Thomas Stützle, Manuel López-Ibáñez.
2. Cloudy distributed evolutionary computation (**NEW**)
JJ Merelo.
3. EC for Feature Selection and Feature Construction (**NEW**)
Mengjie Zhang.
4. Evolutionary Computation and Cryptology (**NEW**)
Stjepan Picek.
5. Evolutionary Computation in Games
Julian Togelius.
6. Intelligent Systems for Smart Cities
Enrique Alba.
7. Medical Applications of Evolutionary Computation
Stephen L. Smith.
8. Meta-Analytics and Evolutionary Methods for Real World Inventory Management Optimization (**NEW**)

WORKSHOPS

Two days of free workshops (included with conference registration) presented by some of the world's foremost experts in topics of interest to genetic and evolutionary computation researchers and practitioners.

1. 6th Workshop on Evolutionary Computation for the Automated Design of Algorithms (ECADA).
2. Algorithms and Data Structures for Evolutionary Computation
3. Bi-Objective Black Box Optimization Benchmarking 2016 (BO-BBOB 2016)
4. Evolution in Cognition
5. Evolutionary Computation in Computational Structural Biology
6. Evolutionary Computation Software Systems (EvoSoft)
7. GECCO Student Workshop
8. Genetic and Evolutionary Computation in Defense, Security, and Risk Management
9. Genetic Improvement Workshop
10. Industrial Applications of Metaheuristics (IAM)
11. International Workshop on Evolutionary Rule-based Machine Learning (Former International Workshop on Learning Classifier Systems)
12. Measuring and Promoting Diversity in Evolutionary Algorithms
13. Medical Applications of Genetic and Evolutionary Computation (MedGEC)
14. Model-Based Evolutionary Algorithms (MBEA)
15. Visualisation Methods in Genetic and Evolutionary Computation (VizGEC 2016)
16. Women@GECCO Workshop
17. Workshop on Surrogate-Assisted Evolutionary Optimisation (SAEOpt 2016)§

Call For Entries for 13th Annual (2016) "Humies" Awards for Human-Competitive Results Produced by Genetic and Evolutionary Computation

www.human-competitive.org

Entries are hereby solicited for awards totaling \$10,000 for human-competitive results that have been produced by any form of genetic and evolutionary computation (including, but not limited to genetic algorithms, genetic programming, evolution strategies, evolutionary programming, learning classifier systems, grammatical evolution, gene expression programming, differential evolution, etc.) and that have been published in the open literature between the deadline for the previous competition and the deadline for the current competition.

The competition will be held as part of the 2016 Genetic and Evolutionary Computation (GECCO) conference. Presentations of entries will be made at the conference. The winners of the awards will be announced during the conference.

See <http://gecco-2016.sigevo.org>.

Important dates:

Monday June 1: Deadline for entries (consisting of one TEXT file and one or more PDF files). Send entries to: koza@human-competitive.org.

Monday June 22: Finalists notified by e-mail

Thursday July 6: Finalists must submit their presentation (e.g., PowerPoint, PDF) for posting on the competition web site. Send presentations to: koza@human-competitive.org.

Wednesday-Sunday July 20-24: GECCO 2016.

Wednesday July 20: (TENTATIVE): Presentations before judging committee at public session of the GECCO conference.

Sunday July 24: (TENTATIVE): Announcement of awards at plenary session of the GECCO conference.

Judging committee

- Erik Goodman
- Una-May O'Reilly
- Wolfgang Banzhaf
- Darrell Whitley
- Lee Spector

Call for entries

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.

This prize competition is based on published results. The publication may be a paper at the GECCO conference (i.e., regular paper, poster paper, or any other full-length paper), a paper published anywhere in the open literature (e.g., another conference, journal, technical report, thesis, book chapter, book), or a paper in final form that has been unconditionally accepted by a publication and is "in press" (that is, the entry must be identical to something that will be published imminently without any further changes). The publication may not be an intermediate or draft version that is still subject to change or revision by the authors or editors. The publication must meet the usual standards of a scientific publication in that it must clearly describe a problem, the methods used to address the problem, the results obtained, and sufficient information about how the work was done in order to enable the work described to be independently replicated.

An automatically created result is considered "human-competitive" if it satisfies at least one of the eight criteria opposite:

(A) The result was patented as an invention in the past, is an improvement over a patented invention, or would qualify today as a patentable new invention.

(B) The result is equal to or better than a result that was accepted as a new scientific result at the time when it was published in a peer-reviewed scientific journal.

(C) The result is equal to or better than a result that was placed into a database or archive of results maintained by an internationally recognized panel of scientific experts.

(D) The result is publishable in its own right as a new scientific result independent of the fact that the result was mechanically created.

(E) The result is equal to or better than the most recent human-created solution to a long-standing problem for which there has been a succession of increasingly better human-created solutions.

(F) The result is equal to or better than a result that was considered an achievement in its field at the time it was first discovered.

(G) The result solves a problem of indisputable difficulty in its field.

(H) The result holds its own or wins a regulated competition involving human contestants (in the form of either live human players or human-written computer programs).

Contestants should note that a pervasive thread in most of the above eight criteria is the notion that the result satisfy an “arms length” standard — not a yardstick based on the opinion of the author, the author’s own institution (educational or corporate), or the author’s own close associates. “Arms length” may be established in numerous ways. For example, if the result is a solution to “a long-standing problem for which there has been a succession of increasingly better human-created solutions,” it is clear that the scientific community (not the author, the author’s own institution, or the author’s close associates) have vetted the significance of the problem. Similarly, a problem’s significance may be established if the result replicates or improves upon a scientific result published in a peer-reviewed scientific journal, replicates or improves upon a previously patented invention, constitutes a patentable new invention, or replicates or improves a result that was considered an achievement in its field at the time it was first discovered. Similarly, a problem’s significance may be established if the result holds its own or wins a regulated competition involving live human players or human-written computer programs. In each of the foregoing examples, the standard for human-competitiveness is being established external to the author, the author’s own institution, or the author’s close associates. It is also conceivable to rely only on criterion G (“The result solves a problem of indisputable difficulty in its field”); however, if only criterion G is claimed, there must be a clear and convincing argument that the problem’s “difficulty” is indeed “indisputable”.

Cash prizes of \$5,000 (gold), \$3,000 (silver), and bronze (either one prize of \$2,000 or two prizes of \$1,000) will be awarded for the best entries that satisfy one or more of the criteria for human-competitiveness. The awards will be divided equally among co-authors unless the authors specify a different division at the time of submission. Prizes are paid by check in U.S. dollars after the GECCO conference. The judges may, based on submissions, rearrange the prize amounts and prize categories within the total amount available for prizes.

Detailed instructions for entering the “Humies” available here:
<http://gecco-2016.sigevo.org/index.html/Humies>

CFP - PPSN 2016: 14th International Conference on Parallel Problem Solving from Nature

PPSN 2016 will be held in Edinburgh, Scotland, UK, 17-21 September 2016

Full details here: <http://www.ppsn2016.org/conference/call-for-papers>

This biennial meeting brings together researchers and practitioners in the field of Natural Computing: the study of computational systems inspired by nature, including biological, ecological, physical, chemical, and social systems. This is a fast-growing interdisciplinary field, featuring a range of techniques and methods for dealing with large, complex, and dynamic problems with various sources of potential uncertainties.

PPSN 2016 will showcase a wide range of topics in Natural Computing including, but not restricted to: Evolutionary Computation, Artificial Neural Networks, Artificial Life, Swarm Intelligence, Artificial Immune Systems, Self-Organising Systems, Emergent Behaviours, Molecular Computing, Evolutionary Robotics, Evolvable Hardware and Applications to Real-World Problems. PPSN 2016 will also feature workshops and tutorials covering advanced and fundamental topics in the field of Natural Computing.

Paper submission FINAL deadline: April 18, 2016



Keynote speakers:

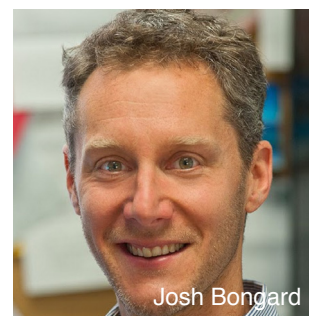
Susan Stepney, University of York, UK

Susan Stepney was originally a theoretical astrophysicist. She moved to industry where she used formal methods to prove the security of smart card applications. In 2002 she returned to academia as Professor of Computer Science at the University of York, UK, where she leads the Non-Standard Computation research group. Since 2012 she has been Director of the York Centre for Complex Systems Analysis. She is on the board of directors of the International Society for Artificial life, and is a member of EPSRC's ICT Strategic Advisory Team. Her current research interests include unconventional models of computation, complex systems, artificial chemistries, emergence, open-ended evolution, and bio-inspired computing.



Josh Bongard, University of Vermont, USA

Josh Bongard obtained his Bachelors degree in Computer Science from McMaster University, Canada; his Masters degree from the University of Sussex, UK; his PhD from the University of Zurich, Switzerland; and served as a postdoctoral associate at Cornell University. In 2006 he was named a Microsoft New Faculty Fellow, as well as one of the top 35 innovators under the age of 35 by MIT's Technology Review Magazine. In 2011 he received a Presidential Early Career Award for Scientists and Engineers (PECASE) from Barack Obama at the White House. Josh is currently the Veinott Professor of Computer Science at the University of Vermont. His research foci include evolutionary robotics, crowdsourcing, and machine science.



Katie Bentley, Harvard Medical School, USA, Bentley, LA

Katie Bentley earned a PhD in Computer Science from UCL in 2006. She was awarded a Cancer Research UK postdoctoral fellowship to develop agent-based models integrated with in vitro and in vivo experiments of blood vessel growth at the London Research Institute in 2006. She was then funded by a Leducq Fondation transatlantic network grant to travel between five highly distinguished Vascular Biology Labs based at Yale, UCLA, KU Leuven and CR UK and develop predictive models tested in vivo. Dr. Bentley was appointed Assistant Professor of Pathology, Harvard Medical School and group leader of the Computational Biology Laboratory at the Center for Vascular Biology Research, Beth Israel Deaconess Medical Center, Boston (2013). She has also recently been appointed Associate Professor at the Rudbeck Laboratories, University of Uppsala, Sweden to lead a second vascular modeling lab integrated within their vascular biology department. Dr. Bentley is on the Board of Directors for the International Society of Artificial Life.



About this newsletter

SIGEVOLution is the newsletter of SIGEVO, the ACM Special Interest Group on Genetic and Evolutionary Computation. To join SIGEVO, please follow this link: [\[WWW\]](#)

Contributing to SIGEVOLution

We solicit contributions in the following categories:

Art: Are you working with Evolutionary Art? We are always looking for nice evolutionary art for the cover page of the newsletter.

Short surveys and position papers: We invite short surveys and position papers in EC and EC related areas. We are also interested in applications of EC technologies that have solved interesting and important problems.

Software: Are you are a developer of an EC software and you wish to tell us about it? Then, send us a short summary or a short tutorial of your software.

Lost Gems: Did you read an interesting EC paper that, in your opinion, did not receive enough attention or should be rediscovered? Then send us a page about it.

Dissertations: We invite short summaries, around a page, of theses in EC-related areas that have been recently discussed and are available online.

Meetings Reports: Did you participate to an interesting EC-related event? Would you be willing to tell us about it? Then, send us a short summary, around half a page, about the event.

Forthcoming Events: If you have an EC event you wish to announce, this is the place.

News and Announcements: Is there anything you wish to announce, such as an employment vacancy? This is the place.

Letters: If you want to ask or to say something to SIGEVO members, please write us a letter!

Suggestions: If you have a suggestion about how to improve the newsletter, please send us an email.

Contributions will be reviewed by members of the newsletter board.

We accept contributions in LATEX, MS Word, and plain text.

Enquiries about submissions and contributions can be emailed to editor@sigevolution.org

All the issues of SIGEVOLution are also available online at: www.sigevolution.org

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