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Genetic Programming

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Proceedings

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Preface

The 25th European Conference on Genetic Programming (EuroGP 2022) took place at the Complutense University of Madrid, Madrid, Spain, during April 20–22, 2022. Due to the travel restrictions caused by the COVID-19 pandemic, the conference was held in a hybrid mode to allow both in-person and online attendance.

Genetic programming (GP) is a unique branch of evolutionary computation that has been developed to automatically solve design problems, in particular the computer program design, without requiring the user to know or specify the form or structure of the solution in advance. It uses the principles of Darwinian evolution to approach problems in the synthesis, improvement, and repair of computer programs. The universality of computer programs, and their importance in so many areas of our lives, means that the automation of these tasks is an exceptionally ambitious challenge with far-reaching implications. GP has attracted a significant number of researchers and a vast amount of theoretical and practical contributions are available, as shown by consulting the GP bibliography.[1]

Since the first EuroGP event in Paris in 1998, EuroGP has been the only conference exclusively devoted to the evolutionary design of computer programs and other computational structures. In fact, EuroGP represents the single largest venue at which GP results are published. It plays an important role in the success of the field, by serving as a forum for expressing new ideas, meeting fellow researchers, and initiating collaborations. It attracts scholars from all over the world. In a friendly and welcoming atmosphere authors present the latest advances in the field and GP-based solutions to complex real-world problems.

EuroGP 2022 received 35 submissions from around the world. The papers underwent a rigorous double-blind peer review process, each being reviewed by multiple members of an international Program Committee.

Among the papers presented in this volume, 12 were accepted for full-length oral presentation (34% acceptance rate) and seven as short talks. In 2022, papers submitted to EuroGP could also be assigned to the "Evolutionary Machine Learning Track". Among the 35 submissions, the authors of eight papers indicated their papers fit the track, with two accepted for full-length oral presentation and four as short talks. Authors of both categories of papers also had the opportunity to present their work in poster sessions to promote the exchange of ideas in a carefree manner.

The wide range of topics in this volume reflects the current state of research in the field. The collection of papers covers interesting topics including developing new variants of GP algorithms, synthesizing computer programs with GP, and evolving neural networks using GP, as well as exploring GP-based explainable or interpretable methods and applying GP to address complex real-world problems.

Together with three other co-located evolutionary computation conferences (Evo-COP 2022, EvoMUSART 2022, and EvoApplications 2022), EuroGP 2022 was part of

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[1] http://liinwww.ira.uka.de/bibliography/Ai/genetic.programming.html.

the Evo* 2022 event. This meeting could not have taken place without the help of many people. The EuroGP Organizing Committee is particularly grateful to the following:

- SPECIES, the Society for the Promotion of Evolutionary Computation in Europe and its Surroundings, which aims to promote evolutionary algorithmic thinking within Europe and wider, and more generally to promote inspiration of parallel algorithms derived from natural processes.
- The high-quality and diverse EuroGP 2022 Program Committee. Each year the members give freely of their time and expertise in order to maintain high standards in EuroGP, providing constructive feedback to help the authors to improve their papers.
- Nuno Lourenço (University of Coimbra, Portugal) for his dedicated work with the submission system.
- João Correia (University of Coimbra, Portugal), Ignacio Hidalgo (Universidad Complutense de Madrid, Spain), and Francisco Chicano (University of Málaga, Spain) for their great work on the Evo* publicity, social media service, and website.
- Sérgio Rebelo (University of Coimbra, Portugal), João Correia (University of Coimbra, Portugal), and Tiago Martins (University of Coimbra, Portugal) for their important graphic design work.
- The local organizing team, in particular Iñaki Hidalgo (Universidad Complutense Madrid, Spain) for his proactivity in getting us a new venue for the conference. We also thank Federico Divina (Universidad Pablo de Olavide, Spain) as the original local organizing chair for Seville, Spain, but unfortunately the conference had to be moved due to the COVID-19 pandemic.
- Our invited speakers, Gabriela Ochoa and Pedro Larrañaga, who gave inspiring and enlightening keynote talks.
- Finally, we express our continued appreciation to Anna I. Esparcia-Alcázar (Universitat Politècnica de València, Spain), from SPECIES, whose considerable efforts in managing and coordinating Evo* helped towards building a unique, vibrant, and friendly atmosphere.

April 2022   Eric Medvet
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