

Message from the Chairs

GI 2023

It is our great pleasure to welcome you to the twelfth edition of the International Genetic Improvement workshop, GI-2023, to take place at ICSE-2023 in Melbourne, Australia, on 20 May 2023. GI@ICSE 2023 is a hybrid event GI that runs both in-person and virtually. Genetic Improvement is essentially the application of search-based software engineering (SBSE) to the software itself. Be it for automatically repairing programs (APR, auto fix) or optimizing existing source, byte, assembler, intermediate or machine code to improve its results or operation. Such as running faster or using less resources (e.g. energy). Since 2015, the GI workshop has been held annually as part of the Genetic and Evolutionary Computation Conference (GECCO) and/or the IEEE/ACM International Conference on Software Engineering (ICSE). We are very pleased that the workshop will also be held at the International Conference on Software Engineering (ICSE) for the fifth time. Its first edition at ICSE 2018 in Göteborg, Sweden (and 4th workshop edition overall), showed that there is great interest in genetic improvement in the software engineering community. Since starting to hold the GI workshop at ICSE, the workshop has also been run several times at GECCO (2018 Kyoto, Japan, 2019 Prague, Czech Republic, 2020 Cancún, Mexico, 2022 Virtual). In addition, several GI tutorials have been given at conferences, such as PPSN 2020, ASE 2020, GECCO 2020 and GECCO 2021. Finally, there have been four two-day CREST Open Workshops (<https://www.ucl.ac.uk/crest/crest-open-workshops>) on Genetic Improvement. COW63 and earlier are archived: http://crest.cs.ucl.ac.uk/cow/past_events/.

The GI workshops continue to bring together researchers from across the world to exchange ideas about using optimisation techniques, particularly evolutionary computation, such as genetic programming, to improve existing software. We invited short two-page position papers to encourage the discussion of new ideas and recent work in addition to longer and more concrete research submissions. The call for participation invited GI work on improving efficiency; decreasing memory consumption; reducing energy consumption; transplanting new functionality; specialising software; translating between programming languages; generating multiple versions of software and repairing bugs. As you will see, half the papers are position papers proposing new ideas, and half are full-length research papers. Most of the submissions came from the UK or Australia, but there were also submissions from Austria, S. Korea, etc.

Putting together GI-2023 was a team effort. Firstly we thank the authors for providing the content of the program. We would like to thank Professor Myra B. Cohen and Dr. Sebastian Baltes for their keynote talks. We are grateful to the program committee, who worked hard to review papers and provide great feedback for authors. Finally, we thank our sponsors: ACM Special Interest Group on Software Engineering (SIGSOFT), IEEE CS Technical Community on Software Engineering (TCSE), and UK Research and Innovation (UKRI).

We hope that you will find these papers thought-provoking and that the workshop will provide you with an opportunity to share ideas with people across the globe. We hope that you will notice many areas of software engineering that are not yet covered. Our primary aim remains to encourage you to participate. Go one step beyond being a better programmer, get the AI to program for you!

Sincerely,
Vesna, Markus, Gabin, Aymeric and Justyna
March 2023

