

Preface

Genetic Programming (GP) is a powerful set of techniques, inspired by natural selection and genetic inheritance, which allows the automatic production of computer programs.

GP, as a method of developing software, is radically different from current software engineering practice. Potentially, in GP, the domain experts, instead of trying to transfer their knowledge to computer programmers, can create programs by directly specifying how they should behave. This is done either by selecting the examples from which GP must learn and generalise, or by grading intermediate solutions. There is great hope in the field that this process of non-mediated automatic knowledge elicitation will dramatically reduce costs and development time while increasing the effectiveness of the programs developed. This hope is corroborated by the success obtained by GP on a large number of difficult problems like automatic design, pattern recognition, robotic control, synthesis of neural networks, symbolic regression, music and picture generation, and many others.

GP as a field was founded by John Koza at the beginning of the 1990s, and has grown exponentially since then. GP is now a separate, very successful branch of its parent field, Evolutionary Computation. More than 1000 papers have been published over the last ten years in GP, with the number still growing quickly. Since 1996, GP has had its own annual international conference held in the United States of America, which is now the largest conference devoted to Evolutionary Computation, and its own European event, EuroGP.

This volume contains the proceedings of EuroGP'99, the Second European Workshop on Genetic Programming, held at the University of Göteborg, Sweden, on 26 and 27 May 1999. EuroGP'99 followed EuroGP'98, which took place in Paris in April 1998. The aim of these events was to give European and non-European researchers in the area of genetic programming, as well as people from industry and commerce, an opportunity to present their latest research and discuss current developments and applications. EuroGP'99 was sponsored by EvoNet, the Network of Excellence in Evolutionary Computation, as one of the activities of EvoGP, the EvoNet working group on genetic programming. The workshop was held in conjunction with three other major European events: EvoRobot'99, the second European workshop on evolutionary robotics, held on 28 and 29 May; EvoIASP'99, the first European workshop on evolutionary image analysis and signal processing, held on 28 May; and EuroECTel'99, the first European workshop on evolutionary telecommunications, held on 29 May.

Twenty-three papers were accepted for publication in this volume and for presentation at the workshop (twelve for oral presentation, eleven as posters). Many of these are by internationally recognised researchers in genetic programming and evolutionary computation, all are of a high quality. This has been ensured by an international programme committee including not only the main

GP experts in Europe but also most of the leading GP researchers from around the world. We are extremely grateful to them for their quick and thorough work, which has allowed us to provide three independent anonymous reviews for each paper submitted despite the limited time available. With such a high-quality international programme committee, with the tutorial given by John Koza, the founder of GP, with the invited speech by David B. Fogel and with authors coming from ten different countries, we believe that the workshop and these proceedings represent a cross section of the best genetic programming research in Europe and in the rest of the world.

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William B. Langdon, and Terence C. Fogarty

Organization

EuroGP'99 is organized by EvoGP, the EvoNet Working Group on Genetic Programming.

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EvoNet: the Network of Excellence in Evolutionary Computing