Computational biology is a wide and varied discipline, incorporating aspects of statistical analysis, data structure and algorithm design, machine learning, and mathematical modeling toward the processing and improved understanding of biological data. Experimentalists now routinely generate new information on such a massive scale that the techniques of computer science are needed to establish any meaningful result. As a consequence, biologists now face the challenges of algorithmic complexity and tractability, and combinatorial explosion when conducting even basic analyses. The goal of the 10th European Conference on Evolutionary Computation, Machine Learning, and Data Mining in Computational Biology (EvoBIO 2012) was to bring together experts across multiple fields to discuss novel methods for tackling complex biological problems, and the beauty of EvoBIO is that often these experts draw inspiration from biological systems in order to produce solutions to biological problems.

The 10th EvoBIO conference was held in Málaga, Spain, during April 11–13, 2012, at the Computer Science School of the University of Málaga, Spain. EvoBIO 2012 was held jointly with the 15th European Conference on Genetic Programming (EuroGP 2012), the 12th European Conference on Evolutionary Computation in Combinatorial Optimization (EvoCOP 2012), the First International Conference and 10th European Event on Evolutionary and Biologically Inspired Music, Sound, Art, and Design (EvoMUSART 2012), and the European Conference on the Applications of Evolutionary Computation. Collectively, the conferences are organized under the name Evo* 2012 (www.evostar.org). EvoBIO, held annually as a workshop since 2003, became a conference in 2007 and it is now the premier European event for those interested in the interface between evolutionary computation, machine learning, and data mining in computational biology. All papers in these proceedings were presented at EvoBIO 2012 in oral or poster presentations, and were received in response to a call for papers soliciting a wide range of topics in the realm of biological data analysis and computational biology.

EvoBIO 2012 added a new submission format: four-page abstracts reviewing, discussing, or extending work previously published in a journal. This form was requested in addition to our existing submission formats: 12-page full research articles describing new developments in methodology, approach, and/or application, eight-page system demonstrations of active or developing systems in research or practice domains, and eight-page short reports describing new methodologies, approaches, and/or applications. After peer review, EvoBIO accepted 15 papers for oral presentation and 8 for poster presentation.

With the goal of sharing inspiration in mind, EvoBIO and EuroGP held a special joint session to celebrate the tenth anniversary of EvoBIO. In this session, advances in the field of genetic programming were applied to problems of
computational biology, and likewise, the unique mechanisms present in biological systems were used to create new extensions to the paradigm of genetic programming. This invigorating session created new collaborations and encouraged the development of new approaches and their application to the biological problem domain.

First and foremost, we thank all the authors who spent time and effort to generate the fantastic contributions to this body of work. We thank the members of the Program Committee for their expert evaluation and review of the submitted papers. We also thank many members of the Evo* community who worked tirelessly to ensure a smooth and successful conference event; Jennifer Willies from Edinburgh Napier University for her unwavering dedication as event coordinator and the Institute for Informatics and Digital Innovation at Edinburgh Napier University; and Penousal Machado from the University of Coimbra for his fantastic work as Publicity Chair. We owe special thanks to Carlos Cotta from the University of Málaga for his outstanding planning as local organizer and for bringing Evo* to the beautiful city of Málaga. We extend our gratitude to the School of Computer Science directed by Jose M. Troya and the School of Telecommunications directed by Antonio Puerta from the University of Málaga for hosting our event, and to the Málaga Convention Bureau for their support of this conference. We also deeply appreciate the work of Marc Schoenauer from INRIA in France and the MyReview team for providing the publication management system and technical support.

We hope you enjoy the fascinating research articles included in this volume, and we invite you to contribute your work to EvoBIO 2013.

April 2012

Mario Giacobini
Leonardo Vanneschi
William S. Bush
EvoBIO 2012, together with EuroGP 2012, EvoCOP 2012, EvoAPPLICATIONS 2012, and EvoMUSART 2012 was part of EVO* 2012, Europe’s premier co-located events in the field of evolutionary computing.

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