Editorial introduction

Lee Spector¹

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This Volume marks the completion of two decades of *Genetic Programming and Evolvable Machines*, which we will celebrate with a Twentieth Anniversary Special Issue edited by Nicholas Freitag McPhee and W. B. Langdon. The editorial process for the anniversary issue is still in progress as I write this introduction, but it is already clear that it will include significant pieces on the history, state of the art, and prospects for future work in the field, from several perspectives and in the context of many application areas. This year we also expect to publish a special issue on Integrating Numerical Optimization Methods with Genetic Programming, under the editorship of Anna I Esparcia-Alcázar and Leonardo Trujillo.

In Volume 19 we published two special issues, one on Automated Design and Adaptation of Heuristics for Scheduling and Combinatorial Optimisation, edited by Su Nguyen, Yi Mei, and Mengjie Zhang, and one on Genetic Programming, Evolutionary Computation and Visualization, edited by Nadia Boukhelifa and Evelyne Lutton. In our regular issues we published original research articles spanning the breadth of the journal's scope, along with six book reviews that were solicited and edited, as usual, by the tireless William B. Langdon.

Following up on suggestions from last summer's board meeting and subsequent discussions with the Advisory Board, we have created a new Thematic Area Editor position in the area of Neural Systems. Dr. Sebastian Risi has agreed to serve in this position. This is an exciting area of growth within the scope of GPME, and I think that Dr. Risi is an ideal person to help strengthen the journal's coverage of the area and to build bridges to communities in related fields.

In addition, Dr. Claire Le Goues has agreed to serve as our Area Editor for Software Engineering, replacing Dr. Mark Harman who stepped down last year. Dr. Le Goues is perfectly situated to help us move forward in this area, which is also experiencing dramatic growth, and to facilitate connections to related communities in software engineering.

In the present issue we have a rich mix of contributions including four regular research articles, a letter, a software review, and two book reviews. One of the research articles, "DENSER: deep evolutionary network structured representation,"

✉ Lee Spector
lspector@hampshire.edu

¹ School of Cognitive Science, Hampshire College, Amherst, MA 01002, USA

by Filipe Assunção, Nuno Lourenço, Penousal Machado, and Bernardete Ribeiro, is an excellent example of the kind of work that we would like to highlight and advance in our new Neural Systems area. The other research articles describe new work on automating the design of representations for evolution (“Designing automatically a representation for grammatical evolution” by Eric Medvet, Alberto Bartoli, Andrea De Lorenzo, and Tarlao, Fabiano), and on applications in finance (“A genetic programming approach for delta hedging” by Zheng Yin, Anthony Brabazon, Conall O’Sullivan, and Philip A. Hamill) and the arts (“Evolving continuous cellular automata for aesthetic objectives” by Jeff Heaton). The “letter” in this issue, “Automated discovery of test statistics using genetic programming” by Jason H. Moore, Randal S. Olson, Yong Chen, and Moshe Sipper, also describes a new application, albeit in a more concise format.

This issue also features three resource reviews: a book review written by Pablo García-Sánchez, of *Artificial Intelligence and Games* by Georgios N. Yannakakis and Julian Togelius, a book review written by Kelly Androutsopoulos, of *Evolutionary algorithms for food science and technology* by Evelyne Lutton, Nathalie Perrot, and Alberto Tonda, and a software review by Jinhan Kim and Shin Yoo, of the DEAP (Distributed Evolutionary Algorithm in Python) library.

Overall, the journal is thriving, with a healthy stream of high-quality submissions and steady or improving statistics for downloads, selectivity, review times, and impact. As always, credit for this is due to the hard work of our authors and our editorial board, and to the collaborative spirit of our research community from which we draw additional reviewers. I hope that this research community will in turn be informed and advanced by the work in Volume 20 of *Genetic Programming and Evolvable Machines*.

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