Editorial Introduction

Welcome to the last issue of Volume 5 of *Evolutionary Computation*. The first paper in the issue is by David Moriarty and Risto Miikkulainen. This work presents an approach to constructing neural networks that is different from most other approaches. In particular, the chromosomes or individuals that make up the population in the evolutionary algorithm are not complete networks; rather, they represent hidden nodes in a two-layer neural network. Sets of neurons (e.g., individuals) must work together in order to develop a complete and functional neural network. While this type of approach may be new to neuroevolution, which combines principles from neural networks and evolutionary algorithms, it is similar in many ways to the approach used in Michigan-style classifier systems, where individuals are rules, and sets of rules must work together to have a complete and functional inference system. This work touches on the issue of cooperative coevolving individuals representing partial solutions.

In the second paper, a more traditional view of coevolution is explored. Ludo Pagie and Paulien Hogeweg explore the evolutionary consequences of coevolving targets. In particular, the paper looks at how different fitness evaluation schemes can affect the genotypes and phenotypes that evolve under coevolution. The paper also explores how the sparseness of the fitness function affects generalization as well as the stability of the solutions that evolve. One of the risks of using a coevolutionary scheme where one population evolves "test sets" designed to challenge a second population as it evolves solutions that attempt to solve the various "tests," is that interactions between the coevolving populations are potentially unstable.

The third paper by Schweitzer, Ebeling, Rose, and Weiss addresses the problem of optimizing road networks. The goal is to provide direct connections between nodes as much as possible while also minimizing construction and maintenance costs, which are a function of road length. The paper also explores the expected improvement in the resulting solution as a function of search effort.

Finally, the paper by Koehler, Bhattacharyya, and Vose represents a significant extension to the theoretical foundations of evolutionary computation. Exact Markov models, describing the behavior of genetic algorithms, have existed for several years. While generalizable to other evolutionary algorithms, and what Vose has called "random heuristic search" methods, the models nevertheless assume the use of binary representations. In this paper, much of the work on Markov models is extended to cover real-valued representations.

The first issue of Volume 6 is currently under construction. It will be a special issue on scheduling applications using evolutionary algorithms. In general, I would like to encourage researchers who are working on significant ground-breaking applications to submit their work to *Evolutionary Computation*.

Finally, I would like to welcome Lisa Kennedy to the journal as Assistant to the Editor. Questions and correspondence can also be directed to Lisa at kennedy@cs.colostate.edu.

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