Computer programs running wild

Antonia J. Jones

Evolutionary Computation. Editor-in-chief Kenneth De Jong. *MIT Press. 4/yr. USA $125, Canada $148.73, elsewhere $139 (institutional); USA $45, Canada $63.13, elsewhere $59 (personal); USA $30, Canada $47.08, elsewhere $44 (student/retired).*

THERE has long been a pressing need for an eclectic journal dealing with 'genetic algorithms', the phrase coined by the US school stemming from the work of John Holland, 'evolutionary programming', originally developed by L. J. Fogel, A. J. Owens and M. J. Walsh, again in the United States, and 'Evolutionsstrategie', as studied in Germany at around the same time by I. Rechenberg and H.-P. Schwefel. Much of this early work took place in the mid-1960s, although the European and US schools seemed largely unaware of each other's existence for quite a while.

The First International Conference on Genetic Algorithms (ICGA) was not in fact held until 1985. It was there that the idea of a journal was initially discussed, but it has taken a further nine years to turn it into a reality. Meanwhile, there were a limited number of options for publishing papers in what had become a rapidly expanding field. The ICGA meetings and later the European Parallel Problem Solving from Nature Conference were the main outlets for work in the field, but conference papers are necessarily rather compressed. And since 1989, the Santa Fe Institute series of annual volumes, edited by C. G. Langton *et al.* (Addison-Wesley), have provided a new perspective and the opportunity to publish longer papers.

Evolutionary Computation is therefore a much needed and welcome addition to the field and its title is appropriate for the proposed coverage, which aims to include mathematical and biological foundations of evolutionary computation, characterization of appropriate problems, parallel models and implementation issues of evolutionary algorithms, evolutionary approaches to machine learning and artificial life, the evolution of neural networks, emergent properties (a rather suspect phrase, I have often thought) and applications of evolutionary computation to problems in science, engineering, economics and so on. Because J. Koza is on the editorial board, it is a safe bet that genetic programming will also be covered.

The first volume begins with "An Overview of Evolutionary Algorithms for Parameter Optimization" (T. Bäck and Schwefel), which, despite the rather dry title, makes fascinating reading and contains an excellent, compact introductory guide to the literature. Subsequent issues contain a variety of interesting papers, all of high standard. Setting aside the inevitable occasional teething problem, the production team have put together a first-class product.

The politics of a developing field are often fraught with difficulty as alternative viewpoints contend for recognition, and Kenneth De Jong is to be congratulated on making a success of a challenging role. □

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Bringing home the bacon

David Willshaw

Neural Computing and Applications. Editors David Bounds, Howard James and Rodney Goodman. *Springer. 4/yr. £130 (institutional); £33 (personal).*

THE field of neural networks (known variously as neural computing, parallel distributed processing or connectionism) is concerned with the development and use of novel algorithms intended to mimic (to a greater or a lesser extent) the workings of the brain. Many new journals covering this interdisciplinary research area have appeared over the past five years. But very few have been targeted at applications — surprisingly few given that many neural-net practitioners fervently believe that the fruits of their research are highly applicable.

This UK-based journal aims to publish "original research and other information in the field of practical applications of neural computing". It also serves as the house journal for the Neural Computing Applications Forum, which holds discussion meetings in the United Kingdom and Europe on topical applications of neural networks. In the issues I received, about a third of the papers would not have been out of place in a middle-of-the-range neural-network journal. The rest describe applications in a variety of areas — for example, forecasting share prices, models of control systems for chemical plants, medical diagnosis and, intriguingly, pig-carcass grading.

In my experience, people working on commercial applications are good at describing what they have achieved, but are rather more coy about how they did it. It is encouraging that in this journal, technical descriptions are reasonably full. In most cases, it is shown that an algorithm based on a neural network (mainly of the back-propagation or self-organizing type) can solve the problem and that neural network variant A is better than neural network variant B. More information would have been welcome on how the neural-network algorithms compared with more standard methods. Perhaps the journal could make a contribution by instituting a set of benchmarks? If it can concentrate on publishing well-validated examples of applications in the field of neural networks then it will perform a useful service. □

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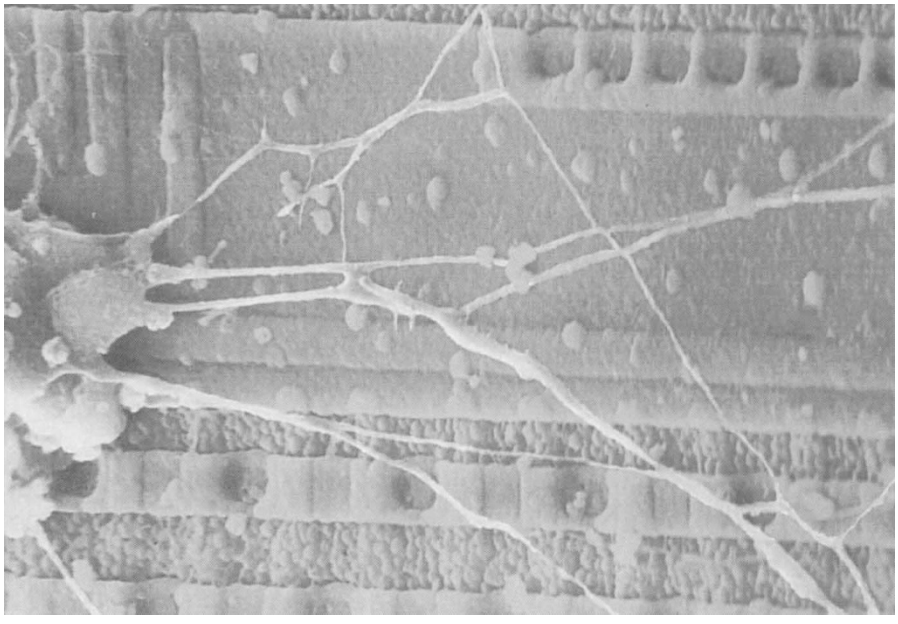

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Biohybrid — human nerve cells growing on a silicon chip.