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Reviewer biography

Current Reviews

Review Articles

Book Reviews Archive

From animals tot animats 7

by Hallam, Bridget, Dario Loreano, John Hallam, Gillian Hayes and Jean-Arcady Meyer (eds.)
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These are the Proceedings of the Seventh International Conference on Simulation of Adaptive Behavior held in Edinburgh in August 2002.

The editors of this book, and probably most of the contributors to the conference and the book as well, believe that the best road to understanding adaptive behavior in uncertain environments is through simulation. In devising and evolving rules for the behavior of not so simple computational systems, we gain insight in the underlying mechanisms of those adapting and evolving systems we call "life". And that is what it is all about. Ecologists, engineers, ethologists and economists believe they can profit form those insights, as well as scientists involved in artificial intelligence, robotics and psychology. To get to the animals, and ultimately to ourselves, we turn to animats. In this sense the title could be read backwards as well: from animats to animals.

However, most of the papers in this book deal with the first swing of the pendulum. Trying to simulate really existing behavior or some subset of all possible behaviors - mostly the more easily formalised subset - of an organism is an enormous challenge and we have a long way to go to fully understand the complexities of the interplay between an organism, its way to perceive the world, the border conditions of its own functionality and the resulting emergent behavior. The other swing will be more daunting still: identifying and understanding the behavior of animals through the multiple analogies with our own creations.

The book is organised in seven themes and contains some seventy papers, carefully selected in a two-tier review process from the 139 presented at the Conference.

'The Animat Approach to Adaptive Behavior' has two must-read papers. Mark Humphrys and Ciaràn O'Leary briefly describe the WorldWideMind (WWM) as an architecture for a distributed interdisciplinary research intelligence. They propose the outlines for a unified mind, constructed from many remote components written by several oauthors. 'The aim is to address the scaling up of animat research, or how to construct minds more complex than could be written one author (or one research group).' In a second part of the paper, the first implementation of this WWM is described and a way to write a WWM server is explained.

The exciting thing about this proposition is that, when the WWM is succesful, it will be in itself a low level simulation of a more complex adaptive system.

Anil K. Seth defends the idea that 'behavioral and/or mechanistic complexity can be understood in terms of mediating well-adapted responses to environmental variability.' The paper profoundly discusses the framework within which ther relations between behavior, mechanism and environment can be usefully articulated. Several examples of agent-based modelling techniques complement this framework.

The other themes of the book are: Perception and motor control; Action selection and behavioral sequences; Internal world models and processes; Self-organization and learning; Evolution; and Collective and social behavior.

It is obvious that this is not a book for someone who wants to get a consistent and easy-to-read introduction in the problems and possibilities of the simulation of adaptive behavior. Instead of the full picture, which I believe no one at present would be able to paint, the reader gets glimpses from very different angles. Browsing through the papers under the different themes is very rewarding though. With some effort, you will get an idea of what the elephant looks like and what the beast has in store for the years to come.

top

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