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Advances in Robot Learning

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Preface

Robot learning is an exciting and interdisciplinary field. This state is reflected in the range and form of the papers presented here. Techniques that have become well established in robot learning are present: evolutionary methods, neural network approaches, reinforcement learning; as are techniques from control theory, logic programming, and Bayesian statistics. It is notalbe that in many of the papers presented in this volume several of these techniques are employed in conjunction. In papers by Nehmzow, Grossmann and Quoy neural networks are utilised to provide landmark-based representations of the environment, but different techniques are used in each paper to make inferences based on these representations.

Biology continues to provide inspiration for the robot learning researcher. In their paper Peter Eggenberger et al. borrow ideas about the role of neuromodulators in switching neural circuits, These are combined with standard techniques from artificial neural networks and evolutionary computing to provide a powerful new algorithm for evolving robot controllers. In the final paper in this volume Bianco and Cassinis combine observations about the navigation behaviour of insects with techniques from control theory to produce their visual landmark learning system. Hopefully this convergence of engineering and biological approaches will continue. A rigourous understanding of the ways techniques from these very different disciplines can be fused is an important challenge if progress is to continue. Al these papers are also testament to the utility of using robots to study intelligence and adaptive behaviour. Working with robots forces us to confront difficult computational problems that may otherwise be all too temptingly swept under the carpet.

In this proceedings we present seven of the talks presented at the 8th European Workshop on Learning Robots in an update and expanded form. These are supplemented by two invited papers, by Ulrich Nehmzow on Map Building for Self-Organisation and by Axel Grossmann and Riccardo Poli on Learning a Navigation Task in Changing Environments by Multi-task Reinforcement Learning. The workshop took place in the friendly surroundings of the Swiss Federal Institute of Technology, (EPFL), Lausanne, Switzerland, in conjunction with the European Conference on Artificial Life '99. The workshop organisers would like to express their deep gratitude to Dario Floreano and all at EPFL who contributed to the success of the meeting. Finally, and certainly not least, we must applaud the programme reviewers who again this year, producing reviews of the highest standard.

June 2000   Jeremy Wyatt
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