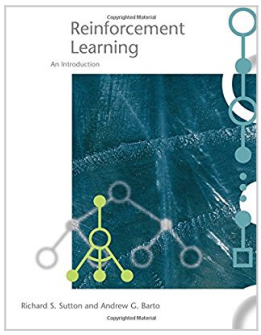

Reinforcement Learning: An Introduction (Adaptive Computation and Machine Learning)

By Richard S. Sutton, Andrew G. Barto

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Reinforcement learning, one of the most active research areas in artificial intelligence, is a computational approach to learning whereby an agent tries to maximize the total amount of reward it receives when interacting with a complex, uncertain environment. In *Reinforcement Learning*, Richard Sutton and Andrew Barto provide a clear and simple account of the key ideas and algorithms of reinforcement learning. Their discussion ranges from the history of the field's intellectual foundations to the most recent developments and applications. The only necessary mathematical background is familiarity with elementary concepts of probability.

The book is divided into three parts. Part I defines the reinforcement learning problem in terms of Markov decision processes. Part II provides basic solution methods: dynamic programming, Monte Carlo methods, and temporal-difference learning. Part III presents a unified view of the solution methods and incorporates artificial neural networks, eligibility traces, and planning; the two final chapters present case studies and consider the future of reinforcement learning.

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Editorial Review

Review

This is a highly intuitive and accessible introduction to the recent major developments in reinforcement learning, written by two of the field's pioneering contributors.

(Dimitri P. Bertsekas and John N. Tsitsiklis, Professors, Department of Electrical Engineering andn Computer Science, Massachusetts Institute of Technology)

This book not only provides an introduction to learning theory but also serves as a tremendous source of ideas for further development and applications in the real world.

(Toshio Fukuda, Nagoya University, Japan; President, IEEE Robotics and Automantion Society)

Reinforcement learning has always been important in the understanding of the driving force behind biological systems, but in the last two decades it has become increasingly important, owing to the development of mathematical algorithms. Barto and Sutton were the prime movers in leading the development of these algorithms and have described them with wonderful clarity in this new text. I predict it will be the standard text.

(Dana Ballard, Professor of Computer Science, University of Rochester)

The widely acclaimed work of Sutton and Barto on reinforcement learning applies some essentials of animal learning, in clever ways, to artificial learning systems. This is a very readable and comprehensive account of the background, algorithms, applications, and future directions of this pioneering and far-reaching work.

(Wolfram Schultz, University of Fribourg, Switzerland)

About the Author

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Andrew G. Barto is Professor of Computer Science at the University of Massachusetts.

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