

Book Selection

Edited by CHRIS BEAUMONT

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Linear Programming and Finite Markovian Control Problems

L.C.M. KALLENBERG

Soon after the introduction of Markov decision processes (M.D.P.s), it was realized that linear programming (L.P.) could be used to solve them. For discounted problems, the theory is straightforward and was soon elaborated, but the average-cost case proved much more stubborn. Indeed, a fully satisfactory L.P. procedure for the most general situation, in which no assumptions are made about the ergodic structure of the underlying Markov chains, was only recently developed by the author of this tract and A. Hordijk. A full description of this work and its underlying and associated theory, together with the simplifications that can be achieved in special cases, constitutes the most valuable original material of the book. Also covered are the total reward criterion, which includes discounting as a special case, semi-Markov processes, and a restricted class of Markov games.

The treatment is comprehensive and may even say the last word on the theory of the application of L.P. and M.D.P.s. Any reader with a sound basic understanding of M.D.P.s, wishing to update his knowledge, should find the book invaluable, especially as L.P. is the only currently available method which can cope with probabilistic constraints, such as bounds on the probability of running out of stock in an inventory problem.

However, another, and perhaps more important, advantage of using L.P. is that modellers can formulate and solve problems as M.D.P.s, using readily available L.P. packages, rather than special algorithms. Such modellers are likely to have little background in M.D.P.s, and could find the book hard going as it is a lightly revised Ph.D. thesis and, though excellent of its kind, reads as such. In mitigation, the author offers step-by-step instructions for each method, and the user prepared to simply 'plug-in' a procedure should be able to do so without too much difficulty.

ROGER HARTLEY

Linear Programming (5th Edition)

SAUL I. GASS

McGraw-Hill, New York, 1985. 532 pp. U.S.\$39.95

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For some reason, Gass has not included stochastic L.P. in this recent edition, although today this technique is considered as one of the most promising L.P.-based