Ronald A. Howard: *Dynamic Programming and Markov Processes*
Verlag Industrielle Organisation, Zürich, 1965, 148 p.

This work is a presentation in German of the English original published by the Massachussetts Institute of Technology. It is published under the care of Prof. Dr. H. Kunz and Dr. P. Kall of the Zürich University.

At present, both dynamic programming and Markov processes are intensely used for operational research linked to the solution of economical and industrial problems.

This work begins by a study of the Markov processes, which the author also studies by means of the Z transform, and for their description he also resorts to the graph method. After the common Markov processes the author studies weighted Markov processes and their asymptotic behaviour.

A special chapter deals with the iterative solution of problems regarding processes of sequential decisions. Likewise, a brief introduction in problems of strategy is given, showing the limits of the application methods mentioned.

Besides the discontinuous processes, continuous decision processes and continuous Markov processes are also studied. The manner in which problems where continuous Markov processes occur can be solved by means of the Laplace transform is shown. Ergodic processes are also studied.

In the entire work the theoretical aspects are completed by intuitive examples taken from economic activity.

The relations between the transistory and recurrent states of the Markov matrix or chain are studied in an appendix.

This work also includes some supplementary data regarding: computing of limit probabilities for completely ergodic processes; elements referring to the eigen values of the stochastic matrices; observations on the Z transform as well as a description of the Markov processes in ALGOL.

This paper represents a development of the doctor's thesis sustained by the author at the Faculty of Electrical Engineering of the well-known Massachussetts Institute of Technology (MIT) and includes the main results obtained by the author in this domain.

The contents of this work has also been presented in the form of lectures for advanced courses regarding systems and operational research engineering, held at the Faculty of Electric Engineering of the MIT.

In the preface due to the well-known specialist R. Bellman, the opinion is expressed that Howard's work is the first systematic study of dynamic programming processes, containing careful formulation of the important types of processes encountered in economical and operational research, as well as a discussion regarding the efficiency of the processes for the numeric determination of optimum strategy.

It is this very "technique of improved strategy", of Howard's, that allows the systematic improvement of an initial strategy until the optimum strategy is obtained. And the importance of the effective algorithms of this nature cannot be sufficiently stressed.

This monography proves highly interesting for all who deal with dynamic programming as a method for solving sequential problems, for all who deal with Markov processes as a mathematical model of actual systems.

The work is particularly useful for all those interested in operational research. Its style and method of presentation make it accessible to a great number of persons interested in operational research.

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