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A Study of some Early Investigations into Controlled Stochastic Processes

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ABSTRACT

The basic ideas of optimal control of stochastic systems in discrete time seems to be originated without doubt by Abraham Wald and Richard Bellman and may be found in their monographs "Statistical Decision Functions" published in 1950 and "Dynamic Programming", in 1957 for the first time under the name of Markovian decision processes. The aim of this poster is to draw the audience's attention to two researchers whose important contributions to control under uncertainty are wrongly not well-known today: Pierre Massé and Kenneth J. Arrow. In his monograph "Les Réserves et la régulation de l'avenir dans la vie économique" Massé developed in 1946 a general theory of optimal control of natural resources including a principle of optimality as an abstraction from the choice of optimal policy for a hydroelectric system (see [1]). Arrow carried out the transition from Wald's sequential analysis to an optimal control theory. In 1949 he presented together with D. Blackwell and M. Girshick a recursive method of construction for Bayes sol utions (backward induction) and the concept of "decision regions". After a fruitful period of research at Stanford he wrote with S. Karlin and H. Scarf in 1958 the famous "Studies in the Mathematical Theory of Inventory and Production" (see [2]).

References

[1] Girlich, H.-J. (1999): On the Development of Modelling Sequential Decision Problems under Uncertainty. University of Exeter (in press).

[2] Girlich, H.-J. and A. Chikán (1998): The Origins of Dynamic Inventory Modelling under Uncertainty. Tenth ISIR Symposium, Budapest (in press).

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