Zamirbek Imanaliev, Zhyrgalbubu Barakova

The Optimal Control Algorithms in Systems with Different Rates of Motion

The basic equations and formulas allow to obtain a decision applying the method of moments.

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Preface

Methods of optimal control, namely, the moments method and the small parameter method are rarely used for the solution of economic problems. Using these methods to economic processes will make it possible to take into account certain influencing factors and their effects, as well as possible to evaluate the changes in the processes.

Application of the method of moments to problems of optimal control of linear, quasi-linear systems are considered in N. N. Krasovskiy N. N. [86], Butkovskiy A. G. [16], Albrecht E. G. [2, 3], Egorov A. I. [37]. Moreover, in those considering systems are used diversely optimized functions of time, linearity and norm.

The method of moments can often help to find the kind of control actions in a closed analytical form [16], and in cases where this is not possible, gives a single computational procedure for constructing the exact or approximate numerical solution of the problem. The complexity of this procedure does not depend on the number of control actions, it depends only on the order of the equation and the nature of the Eigen functions of problem. Application of the method of moments to the economic problems of optimal control singularly perturbed systems in domestic and foreign sources practically does not meet.

Small perturbations in problems of optimal control can be introduced artificially, and then perturbation theory appears as a method of research of the original problem [19]. In this sense, it can be applied to the study of the properties of the main of the trajectories and modes of development of the economic system.

The book is dedicated to two aspects: first aspect is proposed approximate method of decomposition of the original problem of optimal control, which allows

us to formulate it in the form of the problem of moment. It is a new direction in relation to the system under study in the theory of control. Second aspect is the studing of the results of dynamic processes optimal control of the economy.

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