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DYNAMIC IDENTIFICATION OF AN UNKNOWN INPUT IN A HYBRID TYPE SYSTEM

V. L. Rozenberg

An input identification problem in a hybrid system of differential equations is considered from the viewpoint of the approach of the theory of dynamic inversion. The first equation of the system is a quasi-linear stochastic Ito equation, whereas the second one is a linear ordinary equation containing an unknown disturbance. The identification should be performed from the discrete information on a number of realizations of the stochastic process that solves the first equation. The problem is reduced to an inverse problem for a new system of differential equations, which includes, instead of the stochastic equation, an ordinary equation describing the dynamics of the mathematical expectation of the original process. A finite-step software-oriented solution algorithm based on the method of auxiliary feedback controlled models is designed, and its convergence is proved. An example illustrating the operation of a procedure for calibrating the algorithm parameters is presented.

Keywords: hybrid type system, dynamic input identification, controlled model.

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Valeriy Lvovich Rozenberg, Cand. Sci. (Phys.-Math.), Krasovskii Institute of Mathematics and Mechanics of the Ural Branch of the Russian Academy of Sciences, Yekaterinburg, 620108 Russia, e-mail: rozen@imm.uran.ru .

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