In this paper we present an extension of the multiple model methodology by a prognosis mechanism based on learning automata. The approach aims at reducing or even cancelling the occurrence of the inherent control error, which is due to the delayed identification of the active model. We consider the case of a random environment which can be modelled as a Markov process whose state transitions are to be anticipated by the automaton. While a correct prognosis avoids the control error, a false prediction does not increase the error but is used to update the predictor. Our contribution is an extended structure for multiple model control with a bound on the expected occurrence of the inherent control error when asymptotically optimal automata are used. The general approach is applied to financial market modelling, where from a set of recognized patterns the future evolution of the market is predicted and assets are optimally allocated.

Stichworte: