On a problem of synthesis of optimal automata

Tariel Khvedelidze

tariel.Khvedelidze@tsu.ge
Department of Exact and Natural Sciences
Iv. Javakhishvili Tbilisi State University
2, University st. Tbilisi 0143
GEORGIA

Abstract. Considers the functioning of an infinite (with countably many states) automata in a stationary random medium under the assumption, that all possible reactions among are perceived automaton, as referring to one of three classes - the class of favorable reactions (winning), the class of adverse reactions (losing) and the class of neutral reactions (indifference). In the case where the characteristics of a stationary random medium known a priori, based on the relations statistical plausibility is received the algorithm of behavior infinite automaton and is shown, that there are three basic forms (tactics) of its behavior depending on the medium parameters: active form of behavior, a passive form of behavior and a natural form of behavior. On the example of an automaton with a natural form of behavior it is shown that automats that choose their actions based on the likelihood ratio have almost minimal total residence time in the non-optimal area.

Keywords. the infinite automat, the stationary random medium, the statistical plausibility, the behavior of the automaton.