

Abstract for "Chaotic Dynamics of Cellular Learning Automata"

In this Paper, we study Chaotic Dynamics of Cellular Learning Automata (CLA). CLA is a mathematical model for dynamical complex systems that consist of large number of simple components. The simple components, which have learning capability, act together to produce complicated behavioral patterns. A CLA is a Cellular Automata in which a Learning Automaton (LA) is assigned to its every cell. The Learning automaton residing in particular cell determines its state on basis of its action probability vector. Like Cellular Automata, there is a rule that CLA operate under it. The rule of CLA and the actions selected by the neighboring LAs of any particular LA determine the reinforcement signal to the LA residing in that cell. In CLA, the neighboring LAs of any particular LA constitute its local environment, which is nonstationary because it varies as action probability vectors of neighboring LAs vary.