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OPEN SYNCHRONOUS CELLULAR LEARNING AUTOMATA

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Abstract: Cellular learning automata is a combination of learning automata and cellular automata which is superior to cellular learning automata because of its ability to learn and also is superior to learning automaton because it is a collection of learning automata which can interact with each other. Applications of cellular learning automata include various applications such as image processing, a type of cellular learning automata in which the state of a cell in the next stage of its evolution not only depends on the local environment (a

neighbors) but it also depends on the external environments. We call such a cellular learning automata as open cellular learning automata. In this paper, we introduce open cellular learning automata and then study its steady state behavior. It is shown that for a class of rules called compatible rules, the steady state of an open cellular learning automata in stationary external environments converges to a compatible configuration. Then the application of this new model to image segmentation problem is presented.

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