Self-organized Criticality in a Model Based on Neural Network

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Abstract: Based on the LISSOM neural network model, we introduce a model to investigate self-organized criticality in the activity of neural populations. The influence of connection (synapse) between neurons has been adequately considered in this model. It is found to exhibit self-organized criticality (SOC) behavior under appropriate conditions. We also find that the learning process has promotive influence on emergence of SOC behavior. In addition, we analyze the influence of various factors of the model on the SOC behavior, which is characterized by the power-law behavior of the avalanche size distribution.

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