Abstract

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An Evolutionary Coupled Neural Oscillators With Application to Pattern Recognition

. cyclical activities are basic characteristics of all living organisms. neurobiologists have discovered that a single neuron often possesses membrane properties that are responsible for the generation of oscillations. when coupled with other neurons, oscillations with varying properties depending on the type of interconnection can be generated. using synchronizationtemporal correlation of these oscillations can carry out the tasks of pattern recognition of different objects. the speed of recognition depends on the speed of synchronization. in this paper, we propose evolutionary coupled neural oscillators to minimize the time of synchronization through the optimization of the neuron parameters by means of a genetic algorithm. the genetic algorithm, with its global search capability, finds the optimum neuron parameters through a fitness measure that reflects the correlation strength between oscillators, thus avoiding the trial-and-error process of estimating the neuron parameters. the superiority of the method is demonstrated through an application of character recognition process