Synchronization of Coupled Neurons via Robust Feedback

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Abstract

The synchronization of individual neurons is a central topic in understanding the rhythmicity of living organisms in neurosciences. The synchronization problem consists of making two or more systems oscillate in a synchronized way. In this case we require that the signals are identical, at least asymptotically when $t \to \infty$. By using a robust feedback control approach, we provide a method for synchronization of coupled neurons. Simulation results are presented for two case studies. We hope that our control approach can be useful to both study and gain insight of the effect of electrical stimulation of nerve cell, which has a range of clinical applications.

Keywords: Coupled neurons, synchronization, robust feedback.