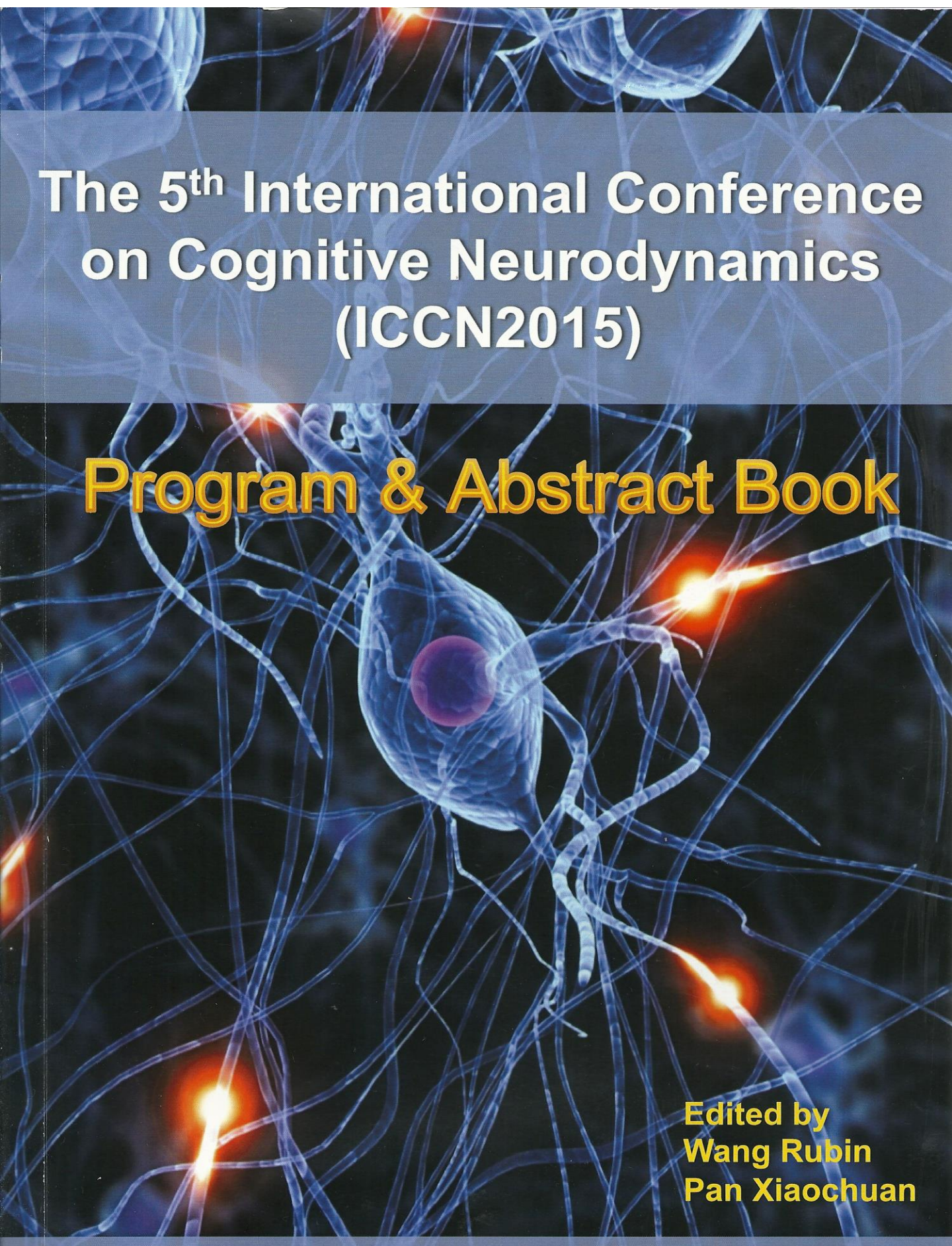
The 5th International Conference on Cognitive Neurodynamics (ICCN2015)



Program & Abstract Book

Edited by
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Pan Xiaochuan

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Sanya, Hainan Province, China

June 6

Poster Session

16:30 - 18:30, 20:00-22:00, June 6

1-09-0003
Spiking Response of a Leaky Integrate-and-Fire Neuron Driven by Periodic Inputs
Junzi Wang, Xianfa Jiao

1-09-0005
Inputs affect periodic firing time of spikes in HR model
Jiaoyan Wang, Huaixing Li

1-09-0007
Synchronization of coupled neuronal network in cold-receptor model
Ying Du, Rubin Wang

1-09-0008
Analysis of Firing Pattern under External Electric Field in Chay Model
Bo Lu, Shenquan Liu and Xuanliang Liu

1-09-0009
The Role of Ion Channels in Firing Dynamics of a Two-Compartment Purkinje Cell Model
Jing Wang and Shenquan Liu

1-09-0010
A modeling research of single compartment and microcircuit in respiratory central pattern generator
Yingteng Zhang, Shenquan Liu, Dongsheng Xiong

1-09-0011
The Influence of Equilibrium Potential on the Mixed-mode Oscillations in a Modified Morris-Lecar Model
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1-10-0002
Modular and Global Sparse Synchronization in Clustered Small-World Networks of Inhibitory Fast Spiking Izhikevich Interneurons
Sang-Yoon Kim and Woochang Lim

1-10-0004
Transition between synchronous behaviors of coupled neurons with reciprocal inhibition and time delay
Zhiguo Zhao, Huaguang Gu

Modular and Global Sparse Synchronization in Clustered Small-World Networks of Inhibitory Fast Spiking Izhikevich Interneurons

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Abstract. We consider a clustered network with small-world sub-networks of inhibitory fast spiking Izhikevich interneurons, and study the effect of inter-modular connection on emergence of fast sparsely synchronized rhythms by varying both the inter-modular coupling strength J_{inter} and the average number of inter-modular connections per interneuron $M_{Syn}^{(inter)}$. In contrast to the case of non-modular networks, two kinds of sparsely synchronized states such as modular and global synchronization are found. We employ a realistic cross-correlation modularity measure, representing the matching-degree between the instantaneous subpopulation spike rates of the sub-networks, and examine whether the sparse synchronization is global or modular. The degrees of the sparse synchronization may also be measured by using realistic statistical-mechanical spiking measures. It is expected that our results have important implications for the role of the brain plasticity which refers to the brain's ability to change its structure and function by modifying the strength or efficacy of synaptic transmission.

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