上海交通大学自动化系
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Key Laboratory of System Control and Information Processing, Ministry of Education

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EvoSpike: Evolving Spiking Neural Networks for Spatio- and Spectro-Temporal Data Modelling and Pattern

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Abstract:

Spatio- and spectro-temporal data (SSTD) are the most common data in many domain areas, including bioinformatics, neuroinformatics, ecology, environment, medicine, engineering, economics, etc. Still there are no sufficient methods to model such data and to discover complex spatio-temporal patterns from it. The brain is functioning as a spatio-temporal information processing machine and brilliantly deals with spatio-temporal data, thus being a natural inspiration for the development of new methods for SSTD. This research aims at the development of new methods for modeling and pattern recognition of SSTD, called evolving probabilistic spiking neural networks (epSNN), along with their applications. epSNN are built on the principles of evolving connectionist systems [1] and eSNN in particular [2,3] and on probabilistic neuronal models (e.g. [4]). The latter extent the popular leaky integrate-and-fire spiking model with the introduction of some biologically plausible probabilistic parameters.

Biography:

Prof. Nikola Kasabov is the Director of the Knowledge Engineering and Discovery Research Institute (KEDRI), Auckland. He holds a Chair of Knowledge Engineering at the School of Computing and Mathematical Sciences at Auckland University of Technology. He is an EU FP7 Marie Curie Visiting Professor at the Institute of Neuroinformatics, ETH and University of Zurich. Kasabov is a Past President of the International Neural Network Society (INNS) and also of the Asia Pacific Neural Network Assembly (APNNA). He is a member of several technical committees of IEEE Computational Intelligence Society and a Distinguished Lecturer of the IEEE CIS. He has served as Associate Editor of Neural Networks, IEEE TrNN, IEEE TrFS, Information Science, J. Theoretical and Computational Nanosciences, Applied Soft Computing and other journals. His main research interests are in the areas of neural networks, intelligent information systems, soft computing, bioinformatics, neuroinformatics. He has published more than 450 publications that include 15 books, 130 journal papers, 60 book chapters, 28 patents and numerous conference papers. More information can be found on the KEDRI web site: http://www.kedri.info.