The NeuCube is a development system for spiking neural network (SNN) applications on complex and large, temporal and/or spatio-/spectro-temporal data (SSTD). NeuCube is based on the evolving connectionist system (ECOS) principles and neuromorphic computations. It facilitates building spatio-temporal data machines (STDM) for problem solving such as classification, prediction, pattern recognition, data analysis and data understanding.

A STDM consists of several modules: an input module to encode input stream data into sequences of spikes; a 3D SNNcube that learns the encoded data in an unsupervised mode to capture spatio-temporal patterns; an evolving output classifier/regressor based on SNN; and an optimisation module.

The NeuCube architecture was first proposed for brain data modelling (N.Kasabov, 2014) and then it was further developed as a multi-modular software/hardware system for large scale applications (Kasabov et al., 2015). A limited trial version of NeuCube V1.0 is available for free from www.kedri.aut.ac.nz/neucube/.

For a full version or for a commercial application, a licence can be obtained from the Knowledge Engineering and Discovery Research Institute (KEDRI). The NeuCube software/hardware development system is intellectual property owned by Auckland University of Technology and PCT protected.
Several modules are included in its full configuration as shown in Fig. 2. Further detailed information on the NeuCube architecture and its applications are given in (Kasabov et al., 2015).

Fig. 2 The NeuCube with its 10 modules.

Fig. 3 The NeuCube-KEDRI team.

REFERENCES:


N.Kasabov et al, Design methodology and selected applications of evolving spatio-temporal data machines in the NeuCube neuromorphic framework, Neural Networks, 2015