NeuroML Editorial Board meeting 2018

An online video conference was held on **6th July 2018** between the NeuroML Editorial Board and interested members of the community to get an update on all current NeuroML related activities.

Attendees: *Padraig Gleeson, Andrew Davison, Robert McDougal, Boris Marin, Upi Bhalla, Matteo Cantarelli*, Salvador Dura-Bernal**
** Non-editor attendees*

Minutes

1) **Update on activities**
    a) **PyNN & NeuroML**
    Interactions between PyNN and NeuroML 2 are well advanced. There is an option to export NeuroML 2 from PyNN scripts in the same way the script can be run in NEURON/NEST/Brian (using *from pyNN.neuroml import* *, as opposed to *from pyNN.nest import* *, etc.). See details on this and other interaction scenarios here:
    https://github.com/NeuroML/NeuroML2/issues/73
    There is also some preliminary interactions between NeuroMLlite and PyNN (see below).

    Andrew reported on some planned updates to PyNN to enable support for multicompartmental neurons. Details in the planned activities can be found here: https://github.com/NeuralEnsemble/PyNN/projects/1. This has been largely motivated by neuromorphic computing systems - the 2nd generations of BrainScaleS and SpiNNaker platforms will both support multicompartmental models.

    Andrew also mentioned some work in progress on morphology validation - see https://github.com/appukuttan-shailesh/morphounit.

    b) **Automated conversion of NMODL -> NeuroML2**
    Background to this issue on making it easier to generate/curate/test NeuroML2 channel files from mod files:
    https://github.com/NeuroML/NeuroML2/issues/101

    The pynmodl repo contains an experimental parser/compiler for *nmodl*, which at the present stage can parse all the K channels in IonChannelGenealogy, and compile 'simple' cases to *NeuroML*. The generated code follows the *nmodl* imperative structure - no 'intelligence' involved (a new *LEMS* Component Type is produced for each *mod* file, without referencing preexisting or more abstract *NeuroML* elements). Once a *mod* file is parsed, a Python data structure (less abstract than an AST) is produced, and that can be used as a Python API (which can be arbitrarily extended) to interact with

nmodl. The project is currently on the backburner, but Boris plans to resume working with it eventually, mainly to extend it with symbolic computing capabilities so we can have heuristics to produce 'efficient', declarative NeuroML from the original imperative code.

c) **MOOSE <-> NeuroML2**
Support for the MOOSE simulator has sadly lagged behind Neuron and other formats in NeuroML version 2. However, there has been a preliminary import function in Moose for some time to natively load NeuroML 2 models and convert them into the native MOOSE format. This has recently been updated and now single compartment Hodgkin Huxley neuron models can be imported and run in MOOSE. Code for the import and some examples can be found here.

d) **NeuroMLlite - JSON based specifications of networks**
This is some recent work in response to a long running issue about providing a compact, JSON based format for describing high level network connectivity, as is being developed independently for NetPyNE, MOOSE and a number of individual models. The issue was outlined in a bit more detail here: https://github.com/NeuroML/NetworkShorthand.
An initial implementation has been made for the proposed format here: https://github.com/NeuroML/NeuroMLlite, and this framework currently interacts with jNeuroML, Neuron, NetPyNE, Nest/Brian (via PyNN), and most recently the Sonata format.
It is in active development, subject to change, but will be a key part of future developments with NeuroML and (large scale) network specification.

e) **Rate based models in NeuroML2/LEMS**
One area of modelling in computational neuroscience where NeuroML2/LEMS has not really covered is modelling where the activity of a population of neurons is represented by an averaged activity or rate (neural mass models). Thankfully a Google Summer of Code project this year has been looking into these types of models. Jessica Dafflon of King's College London has been working with Padraig to convert some models into NeuroML2/LEMS. One example can be seen in progress at https://github.com/OpenSourceBrain/WilsonCowan, and more will be announced in an upcoming blog post on the NeuralEnsemble site.

f) **Models being converted to NeuroML2/PyNN for OSB paper**
A preprint of a paper describing the Open Source Brain resource has been released on bioRxiv: https://www.biorxiv.org/content/early/2018/01/11/229484. As part of this process 28 models on OSB have been curated for use as “best practice” examples of conversion to NeuroML2 & PyNN. For more details see the preprint or visit http://www.opensourcebrain.org/projects.

g) **Other issues**
A number of other issues (incl. noisy inputs in NeuroML, gap junction support, C++/Matlab APIs) have been making slow steady progress. There is a board for managing these project wide issues here: https://github.com/NeuroML/NeuroML2/projects/1

2) **INCF Special Interest Group on Network Specifications**
The INCF is encouraging the neuroinformatics researchers to form Special Interest Groups in scientific and technical areas which require coordination across the community, and will provide some administrative support and help promote the SIGs. Padraig has proposed one on Standardised Representations of Network Structures, and details on the aims, and the current contrinuting people and standards/tools can be found here: https://www.incf.org/activities/standards-and-best-practices/incf-special-interest-groups/incf-sig-on-standardised. A GitHub repository has also been set up for code, documents, issues, etc. https://github.com/NeuralEnsemble/Networks_SIG. NeuroMLlite will be a significant contribution to this from the NeuroML side.

A first activity of this SIG is a workshop at CNS 2018 in Seattle: http://www.opensourcebrain.org/docs/Help/Meetings#CNS_2018

3) **NeuroML Editor elections**
The 3 year terms of Andrew Davison and Upi Bhalla as editors comes to an end in 2018. New elections are due to be held. More details will be announced soon. See https://www.neuroml.org/editors for an overview of the process.