Part I

Conventions

1 Acronyms

ASDF Another System Definition Facility

CTRNN Continuous Time Recurrent Neural Network

2 Licensing

3 Naming

All accessors are prefixed by class name and "-", e.g. "neuron-membrane-potential". All destructive functions and methods are suffixed by an exclamation mark, e.g. "add-neuron!".

Part II

Usage

4 Loading

Another System Definition Facility (ASDF) is used for loading the library. Assuming that ASDF is loaded, acCL-CTRNN can be loaded by:

```
(push \#P"/path/to/cl-ctrnn'' asdf:*central-registry*)
(asdf:oos 'asdf:load-op 'cl-ctrnn)
```

5 Examples

Part III

Classes

6 neural-network

6.1 Description

A Continuous Time Recurrent Neural Network (CTRNN) that simulates a real neural network. Contains neurons(section 7) that may be interconnected with synapses(section 10) and/or connected to external sensors and/or motors.

6.2 Superclasses

None.

6.3 Known subclasses

None.

6.4 Specific methods

6.4.1 Accessors

neural-network-neurons

6.4.2 Other

add-neuron! (neural-network neuron)
synchronously-update-membrane-potentials! (neural-network)

7 neuron

7.1 Description

Representation of a single neuron.

7.2 Superclasses

None.

7.3 Known subclasses

motor-neuron(section 8), sensor-neuron(section 9).

7.4 Specific methods

7.4.1 Accessors

neuron-bias
neuron-dendrites
neuron-external-current
neuron-external-current-magnitude
neuron-maximum-membrane-potential
neuron-membrane-potential
neuron-snapshot-firing-frequency
neuron-time-constant

7.4.2 Other

add-dendrite! (neuron synapse)
firing-frequency (neuron)
update-membrane-potential! (neuron)

8 motor-neuron

8.1 Description

A neuron that will call an external motor-function after updating the membrane-potential.

8.2 Superclasses

neuron(7)

8.3 Known subclasses

None.

8.4 Specific methods

8.4.1 Accessors

motor-neuron-motor-function

8.4.2 Other

None.

9 sensor-neuron

9.1 Description

A neuron that will call an external sensor function before updating membrane-potential.

9.2 Superclasses

neuron(7)

9.3 Known subclasses

None.

9.4 Specific methods

Accessors sensor-neuron-sensor-function

Other None.

10 synapses

10.1 Description

10.2 Superclasses

10.3 Known subclasses

10.4 Methods

10.5 Examples