PyReMoto

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Chapter 1

Namespace Index

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Here are the packages with brief descriptions (if available):

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simulation . . . 13
Synapse . . . 14
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Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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- AxonDelay.AxonDelay . . . 17
- ChannelConductance.ChannelConductance . . . 19
- Compartment.Compartment . . . 21
- Configuration.Configuration . . . 24
- MotorUnit.MotorUnit . . . 26
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- PointProcessGenerator.PointProcessGenerator . . . 40
- PulseConductanceState.PulseConductanceState . . . 41
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Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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: Class that implements a delay correspondent to the nerve . . . 17

ChannelConductance.ChannelConductance
: Class that implements a model of the ionic Channels in a compartment . . . 19

Compartment.Compartment
: Classdocs . . . 21

Configuration.Configuration
: Class that builds an object of Configuration, based on a configuration file . . . 24

MotorUnit.MotorUnit
: Class that implements a motor unit model . . . 26

MotorUnitPool.MotorUnitPool
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Chapter 5

Namespace Documentation

5.1 AxonDelay Namespace Reference

Classes

- class AxonDelay

  Class that implements a delay correspondent to the nerve.

5.2 ChannelConductance Namespace Reference

Classes

- class ChannelConductance

  Class that implements a model of the ionic Channels in a compartment.

5.3 Compartment Namespace Reference

Classes

- class Compartment

  classdocs

Functions

- def calcGLeak

  computes the leak conductance of the compartment input: area: area of the compartment in cm2 specificRes: specific resistance of the compartment in Ohm.cm2 output: gLeak in MS

5.3.1 Function Documentation

5.3.1.1 def Compartment.calcGLeak (*area, specificRes*)

computes the leak conductance of the compartment input: area: area of the compartment in cm2 specificRes: specific resistance of the compartment in Ohm.cm2 output: gLeak in MS

Definition at line 18 of file Compartment.py.

5.4 Configuration Namespace Reference

Classes

- class Configuration

  Class that builds an object of Configuration, based on a configuration file.

5.5 MotorUnit Namespace Reference

Classes

- class MotorUnit

  Class that implements a motor unit model.

Functions

- def calcGCoupling

  Calculates the coupling conductance between two compartments.
- def compGCouplingMatrix

  Computes the Coupling Matrix to be used in the dVdt function of the N compartments of the motor unit.
- def runge_kutta

  Function to implement the fourth order Runge-Kutta Method to solve numerically a differential equation.

5.5.1 Function Documentation

5.5.1.1 def MotorUnit.calcGCoupling (*cytR, lComp1, lComp2, dComp1, dComp2*)

Calculates the coupling conductance between two compartments.

- Inputs:
  - **cytR**: Cytoplasmatic resistance in Ω.cm.
  - **lComp1, lComp2**: length of the compartments in μm.
  - **dComp1, dComp2**: diameter of the compartments in μm.
- Output:
  - coupling conductance in MS

Definition at line 34 of file MotorUnit.py.

5.5.1.2 def MotorUnit.compGCouplingMatrix (*gc*)

Computes the Coupling Matrix to be used in the dVdt function of the N compartments of the motor unit.

The Matrix uses the values obtained with the function calcGcoupling.

$$GC = \begin{bmatrix} -g_c[0] & g_c[0] & 0 & \dots & \dots & 0 & 0 & 0 \\ g_c[0] & -g_c[0]-g_c[1] & g_c[1] & 0 & \dots & \dots & 0 & 0 \\ \vdots & & \ddots & & \dots & & 0 & 0 \\ 0 & \dots & g_c[i-1] & -g_c[i-1]-g_c[i] & g_c[i] & 0 & \dots & 0 \\ 0 & 0 & 0 & \dots & \dots & & & \\ 0 & & \dots & & g_c[N-2] & -g_c[N-2]-g_c[N-1] & g_c[N-1] & \\ 0 & \dots & 0 & & & 0 & g_c[N-1] & -g_c[N-1] \end{bmatrix} \tag{5.1}$$

- Inputs:
  - **gc**: the vector with N elements, with the coupling conductance of each compartment of the Motor Unit.
- Output:
  - the GC matrix

Definition at line 65 of file MotorUnit.py.

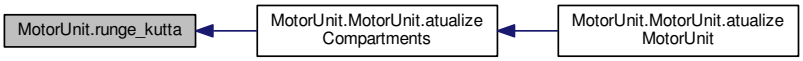
5.5.1.3 def MotorUnit.runge_kutta (*derivativeFunction, t, x, timeStep, timeStepByTwo, timeStepBySix*)

Function to implement the fourth order Runge-Kutta Method to solve numerically a differential equation.

- Inputs:
  - **derivativeFunction**: function that corresponds to the derivative of the differential equation.
  - **t**: current instant.
  - **x**: current state value.
  - **timeStep**: time step of the solution of the differential equation, in the same unit of t.
  - **timeStepByTwo**: timeStep divided by two, for computational efficiency.
  - **timeStepBySix**: timeStep divided by six, for computational efficiency.

Definition at line 98 of file MotorUnit.py.

Here is the caller graph for this function:



5.6 MotorUnitPool Namespace Reference

Classes

- class MotorUnitPool

  classdocs

Functions

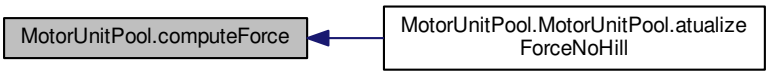
- def twitchSaturation
- def computeForce

5.6.1 Function Documentation

5.6.1.1 def MotorUnitPool.computeForce (*force, TwAmp, TwTet*)

Definition at line 19 of file MotorUnitPool.py.

Here is the caller graph for this function:



5.6.1.2 def MotorUnitPool.twitchSaturation (*force, b*)

Definition at line 15 of file MotorUnitPool.py.

Here is the caller graph for this function:

5.7 NeuralTract Namespace Reference

Classes

- class NeuralTract

  classdocs

5.8 NeuralTractUnit Namespace Reference

Classes

- class NeuralTractUnit

  classdocs

5.9 PointProcessGenerator Namespace Reference

Classes

- class PointProcessGenerator

  classdocs

Functions

- def gammaPoint

5.9.1 Function Documentation

5.9.1.1 def PointProcessGenerator.gammaPoint (*GammaOrder*)

Definition at line 15 of file PointProcessGenerator.py.

5.10 PulseConductanceState Namespace Reference

Classes

- class PulseConductanceState

Functions

- def compValOn
- def compValOff

5.10.1 Function Documentation

5.10.1.1 def PulseConductanceState.compValOff (*v0, alpha, beta, t, t0*)

Definition at line 20 of file PulseConductanceState.py.

5.10.1.2 def PulseConductanceState.compValOn (*v0, alpha, beta, t, t0*)

Definition at line 15 of file PulseConductanceState.py.

5.11 simulation Namespace Reference

Functions

- def simulador

5.11.1 Function Documentation

5.11.1.1 def simulation.simulador ( )

Definition at line 21 of file simulation.py.

5.12 Synapse Namespace Reference

Classes

- class Synapse

  classdocs

Functions

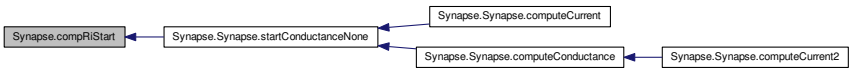
- def compSynapCond
- def compRon
- def compRoff
- def compRiStart
- def compRiStop
- def compRonStart
- def compRoffStart
- def compRonStop
- def compRoffStop

5.12.1 Function Documentation

5.12.1.1 def Synapse.compRiStart (*ri, t, ti, tPeak, tauOff*)

Definition at line 28 of file Synapse.py.

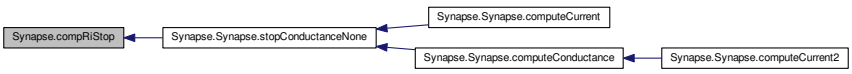
Here is the caller graph for this function:



5.12.1.2 def Synapse.compRiStop (*rInf, ri, expFinish*)

Definition at line 32 of file Synapse.py.

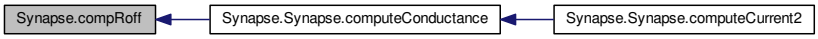
Here is the caller graph for this function:



5.12.1.3 def Synapse.compRoff (*roff, t0, t, tauOff*)

Definition at line 24 of file Synapse.py.

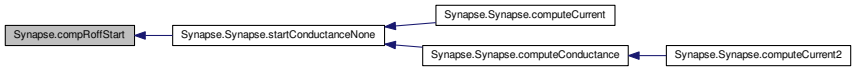
Here is the caller graph for this function:



5.12.1.4 def Synapse.compRoffStart (*Roff, ri, synContrib*)

Definition at line 39 of file Synapse.py.

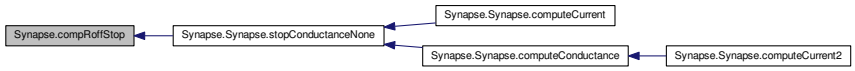
Here is the caller graph for this function:



5.12.1.5 def Synapse.compRoffStop (*Roff, ri, synContrib*)

Definition at line 47 of file Synapse.py.

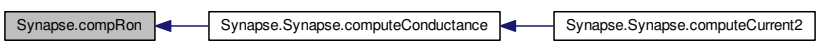
Here is the caller graph for this function:



5.12.1.6 def Synapse.compRon (*Non, rInf, ron, t0, t, tauOn*)

Definition at line 20 of file Synapse.py.

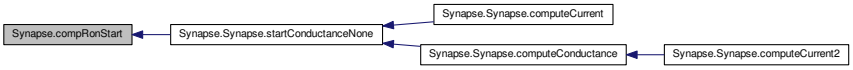
Here is the caller graph for this function:



5.12.1.7 def Synapse.compRonStart (*Ron, ri, synContrib*)

Definition at line 36 of file Synapse.py.

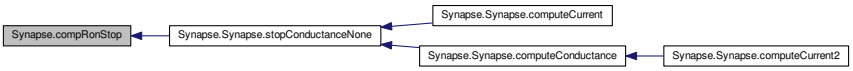
Here is the caller graph for this function:



5.12.1.8 def Synapse.compRonStop (*Ron, ri, synContrib*)

Definition at line 43 of file Synapse.py.

Here is the caller graph for this function:



5.12.1.9 def Synapse.compSynapCond (*Gmax, Ron, Roff*)

Definition at line 16 of file Synapse.py.

Here is the caller graph for this function:

5.13 SynapsesFactory Namespace Reference

Classes

- class SynapsesFactory

  classdocs

Chapter 6

Class Documentation

6.1 AxonDelay.AxonDelay Class Reference

Class that implements a delay correspondent to the nerve.

Public Member Functions

- def __init__
  Constructor.
- def addTerminalSpike
- def addSpinalSpike

Public Attributes

- index
- length_m
- velocity_m_s
- stimulusPositiontoTerminal
- latencyStimulusSpinal_ms
- latencySpinalTerminal_ms
- latencyStimulusTerminal_ms
- terminalSpikeTrain

6.1.1 Detailed Description

Class that implements a delay correspondent to the nerve.

This class corresponds to the part of the axon that is modeled with no dynamics.

Definition at line 15 of file AxonDelay.py.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 def AxonDelay.AxonDelay.__init__ (*self, conf, nerve, pool, index*)

Constructor.

Inputs:

- conf

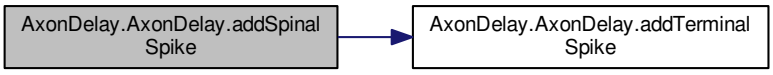
Definition at line 26 of file AxonDelay.py.

6.1.3 Member Function Documentation

6.1.3.1 def AxonDelay.AxonDelay.addSpinalSpike (*self, t*)

Definition at line 45 of file AxonDelay.py.

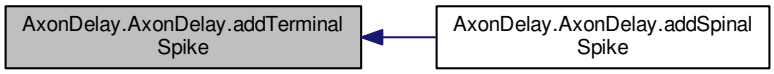
Here is the call graph for this function:



6.1.3.2 def AxonDelay.AxonDelay.addTerminalSpike (*self, t*)

Definition at line 41 of file AxonDelay.py.

Here is the caller graph for this function:



6.1.4 Member Data Documentation

6.1.4.1 AxonDelay.AxonDelay.index

Definition at line 27 of file AxonDelay.py.

6.1.4.2 AxonDelay.AxonDelay.latencySpinalTerminal_ms

Definition at line 34 of file AxonDelay.py.

6.1.4.3 AxonDelay.AxonDelay.latencyStimulusSpinal_ms

Definition at line 33 of file AxonDelay.py.

6.1.4.4 AxonDelay.AxonDelay.latencyStimulusTerminal_ms

Definition at line 35 of file AxonDelay.py.

6.1.4.5 AxonDelay.AxonDelay.length_m

Definition at line 29 of file AxonDelay.py.

6.1.4.6 AxonDelay.AxonDelay.stimulusPositiontoTerminal

Definition at line 31 of file AxonDelay.py.

6.1.4.7 AxonDelay.AxonDelay.terminalSpikeTrain

Definition at line 38 of file AxonDelay.py.

6.1.4.8 AxonDelay.AxonDelay.velocity_m_s

Definition at line 30 of file AxonDelay.py.

The documentation for this class was generated from the following file:

- AxonDelay.py

6.2 ChannelConductance.ChannelConductance Class Reference

Class that implements a model of the ionic Channels in a compartment.

Public Member Functions

- def __init__
  Builds an ionic channel conductance.
- def computeCurrent
  Computes the current genrated by the ionic Channel.
- def compCondKf
  Computes the conductance of a Kf Channel.
- def compCondKs
  Computes the conductance of a Ks Channel.
- def compCondNa
  Computes the conductance of a Na Channel.

Public Attributes

- kind
- condState
- EqPot_mV
- gmax_muS
- stateType
- compCond
- lenStates

6.2.1 Detailed Description

Class that implements a model of the ionic Channels in a compartment.

Definition at line 16 of file ChannelConductance.py.

6.2.2 Constructor & Destructor Documentation

6.2.2.1 def ChannelConductance.ChannelConductance.__init__ (*self, kind, conf, compArea, pool, index*)

Builds an ionic channel conductance.

Inputs: kind - string with the type of the ionic channel (Na, Ks, Kf or Ca) conf - instance of the Configuration class (see Configuration file) compArea - float with the area of the compartment that the Channel belongs, in cm2 pool - the pool that this state belongs. index - the index of the unit that this state belongs.

Definition at line 30 of file ChannelConductance.py.

6.2.3 Member Function Documentation

6.2.3.1 def ChannelConductance.ChannelConductance.compCondKf (*self, V_mV*)

Computes the conductance of a Kf Channel.

This function is assigned as self.compCond to a Kf Channel at the class constructor.

```
Input:
    V_mV - membrane potential of the compartment in mV

Output:
    Conductance in muS
```

Definition at line 90 of file ChannelConductance.py.

6.2.3.2 def ChannelConductance.ChannelConductance.compCondKs (*self, V_mV*)

Computes the conductance of a Ks Channel.

This function is assigned as self.compCond to a Ks Channel at the class constructor.

```
Input:
    V_mV - membrane potential of the compartment in mV

Output:
    Conductance in muS
```

Definition at line 104 of file ChannelConductance.py.

6.2.3.3 def ChannelConductance.ChannelConductance.compCondNa (*self, V_mV*)

Computes the conductance of a Na Channel.

This function is assigned as self.compCond to a Na Channel at the class constructor.

```
Input:
    V_mV - membrane potential of the compartment in mV

Output:
    Conductance in muS
```

Definition at line 118 of file ChannelConductance.py.

6.2.3.4 def ChannelConductance.ChannelConductance.computeCurrent (*self, t, V_mV*)

Computes the current genrated by the ionic Channel.

Inputs: t - instant in ms V_mV - membrane potential of the compartment in mV

Outputs: Ionic current in nA

Definition at line 75 of file ChannelConductance.py.

6.2.4 Member Data Documentation

6.2.4.1 ChannelConductance.ChannelConductance.compCond

Definition at line 44 of file ChannelConductance.py.

6.2.4.2 ChannelConductance.ChannelConductance.condState

Definition at line 32 of file ChannelConductance.py.

6.2.4.3 ChannelConductance.ChannelConductance.EqPot_mV

Definition at line 34 of file ChannelConductance.py.

6.2.4.4 ChannelConductance.ChannelConductance.gmax_muS

Definition at line 35 of file ChannelConductance.py.

6.2.4.5 ChannelConductance.ChannelConductance.kind

Definition at line 31 of file ChannelConductance.py.

6.2.4.6 ChannelConductance.ChannelConductance.lenStates

Definition at line 58 of file ChannelConductance.py.

6.2.4.7 ChannelConductance.ChannelConductance.stateType

Definition at line 37 of file ChannelConductance.py.

The documentation for this class was generated from the following file:

- ChannelConductance.py

6.3 Compartment.Compartment Class Reference

classdocs

Public Member Functions

- def __init__

  Constructor.
- def computeCurrent

Public Attributes

- Channels
- neuronKind
- SynapsesOut
- SynapsesIn
- kind
- index
- length_mum
- diameter_mum
- area_cm2
- specifRes_Ohmcm2
- capacitance_nF
- gLeak
- numberChannels
- numberofMultiSynapses

6.3.1 Detailed Description

classdocs

Definition at line 25 of file Compartment.py.

6.3.2 Constructor & Destructor Documentation

6.3.2.1 def Compartment.Compartment.__init__ (*self, kind, conf, pool, index, neuronKind*)

Constructor.

Definition at line 32 of file Compartment.py.

6.3.3 Member Function Documentation

6.3.3.1 def Compartment.Compartment.computeCurrent (*self, t, V_mV*)

Definition at line 66 of file Compartment.py.

6.3.4 Member Data Documentation

6.3.4.1 Compartment.Compartment.area_cm2

Definition at line 49 of file Compartment.py.

6.3.4.2 Compartment.Compartment.capacitance_nF

Definition at line 51 of file Compartment.py.

6.3.4.3 Compartment.Compartment.Channels

Definition at line 34 of file Compartment.py.

6.3.4.4 Compartment.Compartment.diameter_mum

Definition at line 48 of file Compartment.py.

6.3.4.5 Compartment.Compartment.gLeak

Definition at line 52 of file Compartment.py.

6.3.4.6 Compartment.Compartment.index

Definition at line 45 of file Compartment.py.

6.3.4.7 Compartment.Compartment.kind

Definition at line 42 of file Compartment.py.

6.3.4.8 Compartment.Compartment.length_mum

Definition at line 47 of file Compartment.py.

6.3.4.9 Compartment.Compartment.neuronKind

Definition at line 35 of file Compartment.py.

6.3.4.10 Compartment.Compartment.numberChannels

Definition at line 62 of file Compartment.py.

6.3.4.11 Compartment.Compartment.numberofMultiSynapses

Definition at line 63 of file Compartment.py.

6.3.4.12 Compartment.Compartment.specifRes_Ohmcm2

Definition at line 50 of file Compartment.py.

6.3.4.13 Compartment.Compartment.SynapsesIn

Definition at line 38 of file Compartment.py.

6.3.4.14 Compartment.Compartment.SynapsesOut

Definition at line 36 of file Compartment.py.

The documentation for this class was generated from the following file:

- Compartment.py

6.4 Configuration.Configuration Class Reference

Class that builds an object of Configuration, based on a configuration file.

Public Member Functions

- def __init__

  Constructor.
- def parameterSet

  Function that returns the value of wished parameter specified in the paramTag variable.
- def inputFunctionGet

  Returns a numpy array with the values of the function for the whole simulation.
- def determineSynapses

  Function used to determine all the synapses that a given pool makes.

Public Attributes

- confArray

  An array with all the simulation parameters.
- timeStep_ms

  Time step of the numerical solution of the differential equation.
- simDuration_ms

  Total length of the simulation in ms.
- timeStepByTwo_ms

  The variable timeStep divided by two, for computaional efficiency.
- timeStepBySix_ms

  The variable timeStep divided by six, for computaional efficiency.

6.4.1 Detailed Description

Class that builds an object of Configuration, based on a configuration file.

Definition at line 13 of file Configuration.py.

6.4.2 Constructor & Destructor Documentation

6.4.2.1 def Configuration.Configuration.__init__ (*self, filename*)

Constructor.

Builds the Configuration object.

```
Inputs:
    - filename: name of the file with the paremeter values. The extension  of the file should be .rmto


    The variables timeStep and simDuration that are used in the whole system are set at the constructor
of the Configuration class.
```

Definition at line 31 of file Configuration.py.

6.4.3 Member Function Documentation

6.4.3.1 def Configuration.Configuration.determineSynapses (*self, neuralSource*)

Function used to determine all the synapses that a given pool makes.

It is used in the SynapsesFactory class.

```
Inputs:

    neuralSource - string with the pool name from which is desired to know what synapses it will make.

Outputs:
    - array of strings with all the synapses target that the neuralSource will make.
```

Definition at line 137 of file Configuration.py.

6.4.3.2 def Configuration.Configuration.inputFunctionGet (*self, function*)

Returns a numpy array with the values of the function for the whole simulation.

It is used to obtain before the simulation run all the values of the inputs.

```
Inputs:

    function - function from which is desired to obtain its values  during the simulation duration.

Output:

    - narray with the function values for each instant.
```

Definition at line 119 of file Configuration.py.

6.4.3.3 def Configuration.Configuration.parameterSet (*self, paramTag, pool, index*)

Function that returns the value of wished parameter specified in the paramTag variable.

In the case of min/max parameters, the value returned is the specific to the index of the unit that called the function.

```
Inputs:

    paramTag - string with the name of the wished parameter as in the first column of the rmto file.

    pool - pool from which the unit that will receive the parameter value belongs. For example SOL.
    It is used only in the parameters that have a range.

    index - index of the unit. It is is an integer.

Outputs:

    - required parameter value
```

Definition at line 72 of file Configuration.py.

6.4.4 Member Data Documentation

6.4.4.1 Configuration.Configuration.confArray

An array with all the simulation parameters.

Definition at line 34 of file Configuration.py.

6.4.4.2 Configuration.Configuration.simDuration_ms

Total length of the simulation in ms.

Definition at line 44 of file Configuration.py.

6.4.4.3 Configuration.Configuration.timeStep_ms

Time step of the numerical solution of the differential equation.

Definition at line 41 of file Configuration.py.

6.4.4.4 Configuration.Configuration.timeStepBySix_ms

The variable timeStep divided by six, for computaional efficiency.

Definition at line 48 of file Configuration.py.

6.4.4.5 Configuration.Configuration.timeStepByTwo_ms

The variable timeStep divided by two, for computaional efficiency.

Definition at line 46 of file Configuration.py.

The documentation for this class was generated from the following file:

- Configuration.py

6.5 MotorUnit.MotorUnit Class Reference

Class that implements a motor unit model.

Public Member Functions

- def __init__
  Constructor.
- def atualizeMotorUnit
  Atualize the dynamical and nondynamical (delay) parts of the motor unit.
- def atualizeCompartments
  Atualize all neural compartments.
- def dVdt
  Compute the potential derivative of all compartments of the motor unit.
- def addSomaSpike
  When the soma potential is above the threshold a spike is added tom the soma.
- def atualizeDelay
  Atualize the terminal spike train, by considering the Delay of the nerve.

Public Attributes

- conf
  Configuration object with the simulation parameters.
- kind
  String with the type of the motor unit.

- tSomaSpike

  The instant of the last spie of the Motor unit at the Soma compartment.
- somaSpikeTrain

  Vector with the instants of spikes at the soma.
- index

  Integer corresponding to the motor unit order in the pool, according to the Henneman's principle (size principle).
- compartment

  Vector of Compartment of the Motor Unit.
- threshold_mV

  Value of the membrane potential, in mV, that is considered a spike.
- compNumber

  Number of compartments.
- v_mV

  Vector with membrane potential,in mV, of all compartments.
- capacitanceInv

  Vector with the inverse of the capacitanece of all compartments.
- iIonic

  Vector with current, i nA, of each compartment coming from other elements of the model.
- iInjected

  Vector with the current, in nA, injected in each compartment.
- G

  Matrix of the conductance of the motoneuron.
- somaIndex

  index of the soma compartment.
- MNRefPer_ms

  Refractory period, in ms, of the motoneuron.
- nerve

  String with type of the nerve.
- Delay

  AxonDelay object of the motor unit.
- terminalSpikeTrain

  Vector with the instants of spikes at the terminal.
- TwitchTc_ms

  Contraction time of the twicth muscle unit, in ms.
- TwitchAmp_N

  Amplutude of the muscle unit twicth, in N.
- bSat

  Parameter of the saturation.
- twTet

  Twitch- tetanus relationship.

6.5.1 Detailed Description

Class that implements a motor unit model.

Encompasses a motoneuron and a muscle unit.

Definition at line 112 of file MotorUnit.py.

6.5.2 Constructor & Destructor Documentation

6.5.2.1 def MotorUnit.MotorUnit.__init__ (*self, conf, pool, index, kind*)

Constructor.

- Inputs:
  - **conf**: Configuration object with the simulation parameters.
  - **pool**: string with Motor unit pool to which the motor unit belongs.
  - **index**: integer corresponding to the motor unit order in the pool, according to the Henneman's principle (size principle).
  - **kind**: string with the type of the motor unit. It can be S (slow), FR (fast and resistant), and FF (fast and fatigable).

Definition at line 130 of file MotorUnit.py.

6.5.3 Member Function Documentation

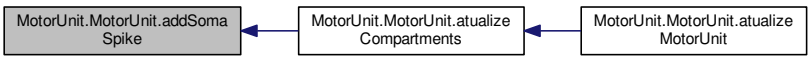
6.5.3.1 def MotorUnit.MotorUnit.addSomaSpike (*self, t*)

When the soma potential is above the threshold a spike is added tom the soma.

- Inputs:
  - **t**: current instant, in ms.

Definition at line 281 of file MotorUnit.py.

Here is the caller graph for this function:



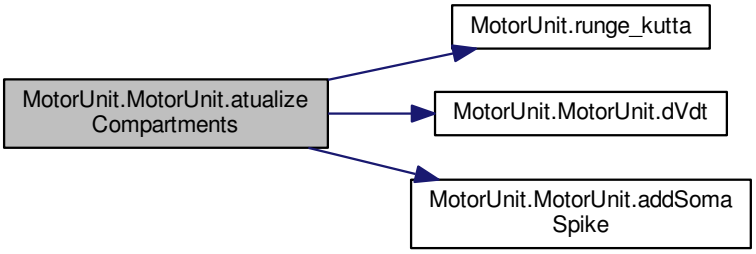
6.5.3.2 def MotorUnit.MotorUnit.atualizeCompartments (*self, t*)

Atualize all neural compartments.

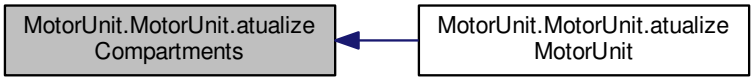
- Inputs:
  - **t**: current instant, in ms.

Definition at line 251 of file MotorUnit.py.

Here is the call graph for this function:



Here is the caller graph for this function:



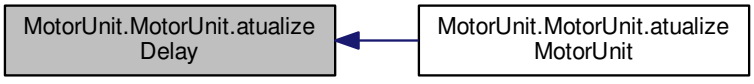
6.5.3.3 def MotorUnit.MotorUnit.atualizeDelay (*self, t*)

Atualize the terminal spike train, by considering the Delay of the nerve.

- Inputs:
  - **t**: current instant, in ms.

Definition at line 297 of file MotorUnit.py.

Here is the caller graph for this function:



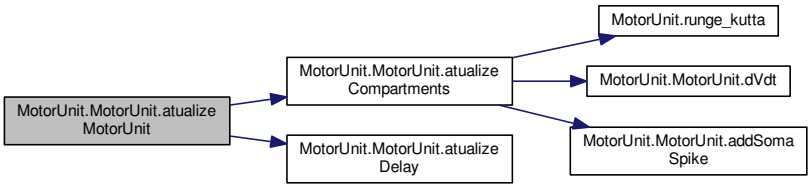
6.5.3.4 def MotorUnit.MotorUnit.atualizeMotorUnit (*self, t*)

Atualize the dynamical and nondynamical (delay) parts of the motor unit.

- Inputs:
  - **t**: current instant, in ms.

Definition at line 239 of file MotorUnit.py.

Here is the call graph for this function:



6.5.3.5 def MotorUnit.MotorUnit.dVdt (*self, t, V*)

Compute the potential derivative of all compartments of the motor unit.

- Inputs:
  - **t**: current instant, in ms.
  - **V**: Vector with the current potential value of all neural compartments of the motor unit.

Definition at line 266 of file MotorUnit.py.

Here is the caller graph for this function:

6.5.4 Member Data Documentation

6.5.4.1 MotorUnit.MotorUnit.bSat

Parameter of the saturation.

Definition at line 224 of file MotorUnit.py.

6.5.4.2 MotorUnit.MotorUnit.capacitanceInv

Vector with the inverse of the capacitanece of all compartments.

Definition at line 176 of file MotorUnit.py.

6.5.4.3 MotorUnit.MotorUnit.compartment

Vector of Compartment of the Motor Unit.

Definition at line 147 of file MotorUnit.py.

6.5.4.4 MotorUnit.MotorUnit.compNumber

Number of compartments.

Definition at line 154 of file MotorUnit.py.

6.5.4.5 MotorUnit.MotorUnit.conf

Configuration object with the simulation parameters.

Definition at line 133 of file MotorUnit.py.

6.5.4.6 MotorUnit.MotorUnit.Delay

AxonDelay object of the motor unit.

Definition at line 209 of file MotorUnit.py.

6.5.4.7 MotorUnit.MotorUnit.G

Matrix of the conductance of the motoneuron.

Multiplied by the vector self.v_mV, results in the passive currents of each compartment.

Definition at line 191 of file MotorUnit.py.

6.5.4.8 MotorUnit.MotorUnit.iInjected

Vector with the current, in nA, injected in each compartment.

Definition at line 182 of file MotorUnit.py.

6.5.4.9 MotorUnit.MotorUnit.iIonic

Vector with current, i nA, of each compartment coming from other elements of the model.

For example from ionic channels and synapses.

Definition at line 180 of file MotorUnit.py.

6.5.4.10 MotorUnit.MotorUnit.index

Integer corresponding to the motor unit order in the pool, according to the Henneman's principle (size principle).

Definition at line 145 of file MotorUnit.py.

6.5.4.11 MotorUnit.MotorUnit.kind

String with the type of the motor unit.

It can be S (slow), FR (fast and resistant) and FF (fast and fatigable).

Definition at line 136 of file MotorUnit.py.

6.5.4.12 MotorUnit.MotorUnit.MNRefPer_ms

Refractory period, in ms, of the motoneuron.

Definition at line 198 of file MotorUnit.py.

6.5.4.13 MotorUnit.MotorUnit.nerve

String with type of the nerve.

It can be PTN (posterior tibial nerve) or CPN (common peroneal nerve).

Definition at line 204 of file MotorUnit.py.

6.5.4.14 MotorUnit.MotorUnit.somaIndex

index of the soma compartment.

Definition at line 195 of file MotorUnit.py.

6.5.4.15 MotorUnit.MotorUnit.somaSpikeTrain

Vector with the instants of spikes at the soma.

Definition at line 143 of file MotorUnit.py.

6.5.4.16 MotorUnit.MotorUnit.terminalSpikeTrain

Vector with the instants of spikes at the terminal.

Definition at line 213 of file MotorUnit.py.

6.5.4.17 MotorUnit.MotorUnit.threshold_mV

Value of the membrane potential, in mV, that is considered a spike.

Definition at line 149 of file MotorUnit.py.

6.5.4.18 MotorUnit.MotorUnit.tSomaSpike

The instant of the last spie of the Motor unit at the Soma compartment.

Definition at line 140 of file MotorUnit.py.

6.5.4.19 MotorUnit.MotorUnit.TwitchAmp_N

Amplutude of the muscle unit twicth, in N.

Definition at line 222 of file MotorUnit.py.

6.5.4.20 MotorUnit.MotorUnit.TwitchTc_ms

Contraction time of the twicth muscle unit, in ms.

Definition at line 220 of file MotorUnit.py.

6.5.4.21 MotorUnit.MotorUnit.twTet

Twitch- tetanus relationship.

Definition at line 226 of file MotorUnit.py.

6.5.4.22 MotorUnit.MotorUnit.v_mV

Vector with membrane potential,in mV, of all compartments.

Definition at line 156 of file MotorUnit.py.

The documentation for this class was generated from the following file:

- MotorUnit.py

6.6 MotorUnitPool.MotorUnitPool Class Reference

classdocs

Public Member Functions

- def __init__
  Constructor.
- def atualizeMotorUnitPool
- def atualizeActivationSignal
- def atualizeForceNoHill
- def listSpikes

Public Attributes

- kind
- conf
- pool
- MUnumber
- unit
- poolSomaSpikes
- poolTerminalSpikes
- activationModel
  activation signal
- ActMatrix
- an
- activation_nonSat
- bSat
- twTet
- twitchAmp_N
- activation_Sat
- diracDeltaValue
- force
- hillModel
- atualizeForce
- timeIndex

6.6.1 Detailed Description

classdocs

Definition at line 27 of file MotorUnitPool.py.

6.6.2 Constructor & Destructor Documentation

6.6.2.1 def MotorUnitPool.MotorUnitPool.__init__ (*self, conf, pool*)

Constructor.

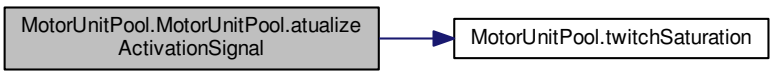
Definition at line 34 of file MotorUnitPool.py.

6.6.3 Member Function Documentation

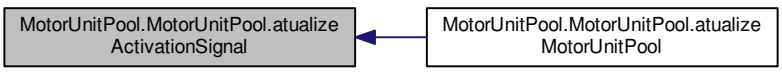
6.6.3.1 def MotorUnitPool.MotorUnitPool.atualizeActivationSignal (*self, t*)

Definition at line 107 of file MotorUnitPool.py.

Here is the call graph for this function:



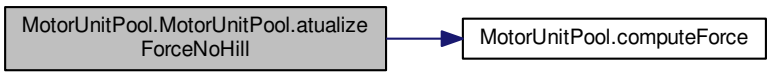
Here is the caller graph for this function:



6.6.3.2 def MotorUnitPool.MotorUnitPool.atualizeForceNoHill (*self*)

Definition at line 119 of file MotorUnitPool.py.

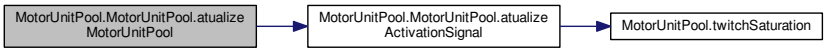
Here is the call graph for this function:



6.6.3.3 def MotorUnitPool.MotorUnitPool.atualizeMotorUnitPool (*self, t*)

Definition at line 100 of file MotorUnitPool.py.

Here is the call graph for this function:



6.6.3.4 def MotorUnitPool.MotorUnitPool.listSpikes (*self*)

Definition at line 125 of file MotorUnitPool.py.

6.6.4 Member Data Documentation

6.6.4.1 MotorUnitPool.MotorUnitPool.activation_nonSat

Definition at line 76 of file MotorUnitPool.py.

6.6.4.2 MotorUnitPool.MotorUnitPool.activation_Sat

Definition at line 85 of file MotorUnitPool.py.

6.6.4.3 MotorUnitPool.MotorUnitPool.activationModel

activation signal

Definition at line 59 of file MotorUnitPool.py.

6.6.4.4 MotorUnitPool.MotorUnitPool.ActMatrix

Definition at line 64 of file MotorUnitPool.py.

6.6.4.5 MotorUnitPool.MotorUnitPool.an

Definition at line 74 of file MotorUnitPool.py.

6.6.4.6 MotorUnitPool.MotorUnitPool.atualizeForce

Definition at line 92 of file MotorUnitPool.py.

6.6.4.7 MotorUnitPool.MotorUnitPool.bSat

Definition at line 77 of file MotorUnitPool.py.

6.6.4.8 MotorUnitPool.MotorUnitPool.conf

Definition at line 36 of file MotorUnitPool.py.

6.6.4.9 MotorUnitPool.MotorUnitPool.diracDeltaValue

Definition at line 87 of file MotorUnitPool.py.

6.6.4.10 MotorUnitPool.MotorUnitPool.force

Definition at line 90 of file MotorUnitPool.py.

6.6.4.11 MotorUnitPool.MotorUnitPool.hillModel

Definition at line 91 of file MotorUnitPool.py.

6.6.4.12 MotorUnitPool.MotorUnitPool.kind

Definition at line 35 of file MotorUnitPool.py.

6.6.4.13 MotorUnitPool.MotorUnitPool.MUnumber

Definition at line 41 of file MotorUnitPool.py.

6.6.4.14 MotorUnitPool.MotorUnitPool.pool

Definition at line 37 of file MotorUnitPool.py.

6.6.4.15 MotorUnitPool.MotorUnitPool.poolSomaSpikes

Definition at line 54 of file MotorUnitPool.py.

6.6.4.16 MotorUnitPool.MotorUnitPool.poolTerminalSpikes

Definition at line 55 of file MotorUnitPool.py.

6.6.4.17 MotorUnitPool.MotorUnitPool.timeIndex

Definition at line 94 of file MotorUnitPool.py.

6.6.4.18 MotorUnitPool.MotorUnitPool.twitchAmp_N

Definition at line 79 of file MotorUnitPool.py.

6.6.4.19 MotorUnitPool.MotorUnitPool.twTet

Definition at line 78 of file MotorUnitPool.py.

6.6.4.20 MotorUnitPool.MotorUnitPool.unit

Definition at line 43 of file MotorUnitPool.py.

The documentation for this class was generated from the following file:

- MotorUnitPool.py

6.7 NeuralTract.NeuralTract Class Reference

classdocs

Public Member Functions

- def __init__
  Constructor.
- def atualizePool
- def listSpikes

Public Attributes

- kind
- pool
- Number
- unit
- poolTerminalSpikes
- target
- FR
- timeIndex

6.7.1 Detailed Description

classdocs

Definition at line 14 of file NeuralTract.py.

6.7.2 Constructor & Destructor Documentation

6.7.2.1 def NeuralTract.NeuralTract.__init__ (*self, conf, pool*)

Constructor.

Definition at line 21 of file NeuralTract.py.

6.7.3 Member Function Documentation

6.7.3.1 def NeuralTract.NeuralTract.atualizePool (*self, t*)

Definition at line 45 of file NeuralTract.py.

6.7.3.2 def NeuralTract.NeuralTract.listSpikes (*self*)

Definition at line 50 of file NeuralTract.py.

6.7.4 Member Data Documentation

6.7.4.1 NeuralTract.NeuralTract.FR

Definition at line 38 of file NeuralTract.py.

6.7.4.2 NeuralTract.NeuralTract.kind

Definition at line 22 of file NeuralTract.py.

6.7.4.3 NeuralTract.NeuralTract.Number

Definition at line 24 of file NeuralTract.py.

6.7.4.4 NeuralTract.NeuralTract.pool

Definition at line 23 of file NeuralTract.py.

6.7.4.5 NeuralTract.NeuralTract.poolTerminalSpikes

Definition at line 29 of file NeuralTract.py.

6.7.4.6 NeuralTract.NeuralTract.target

Definition at line 31 of file NeuralTract.py.

6.7.4.7 NeuralTract.NeuralTract.timeIndex

Definition at line 41 of file NeuralTract.py.

6.7.4.8 NeuralTract.NeuralTract.unit

Definition at line 26 of file NeuralTract.py.

The documentation for this class was generated from the following file:

- NeuralTract.py

6.8 NeuralTractUnit.NeuralTractUnit Class Reference

classdocs

Public Member Functions

- def __init__
  Constructor.
- def atualizeNeuralTractUnit
- def transmitSpikes

Public Attributes

- GammaOrder
- spikesGenerator
- terminalSpikeTrain
- SynapsesOut
- transmitSpikesThroughSynapses
- indicesOfSynapsesOnTarget

6.8.1 Detailed Description

classdocs

Definition at line 20 of file NeuralTractUnit.py.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 def NeuralTractUnit.NeuralTractUnit.__init__ (*self, conf, pool, index*)

Constructor.

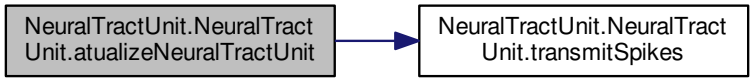
Definition at line 27 of file NeuralTractUnit.py.

6.8.3 Member Function Documentation

6.8.3.1 def NeuralTractUnit.NeuralTractUnit.atualizeNeuralTractUnit (*self, t, FR*)

Definition at line 49 of file NeuralTractUnit.py.

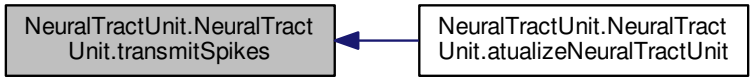
Here is the call graph for this function:



6.8.3.2 def NeuralTractUnit.NeuralTractUnit.transmitSpikes (*self, t*)

Definition at line 59 of file NeuralTractUnit.py.

Here is the caller graph for this function:



6.8.4 Member Data Documentation

6.8.4.1 NeuralTractUnit.NeuralTractUnit.GammaOrder

Definition at line 29 of file NeuralTractUnit.py.

6.8.4.2 NeuralTractUnit.NeuralTractUnit.indicesOfSynapsesOnTarget

Definition at line 41 of file NeuralTractUnit.py.

6.8.4.3 NeuralTractUnit.NeuralTractUnit.spikesGenerator

Definition at line 32 of file NeuralTractUnit.py.

6.8.4.4 NeuralTractUnit.NeuralTractUnit.SynapsesOut

Definition at line 39 of file NeuralTractUnit.py.

6.8.4.5 NeuralTractUnit.NeuralTractUnit.terminalSpikeTrain

Definition at line 33 of file NeuralTractUnit.py.

6.8.4.6 NeuralTractUnit.NeuralTractUnit.transmitSpikesThroughSynapses

Definition at line 40 of file NeuralTractUnit.py.

The documentation for this class was generated from the following file:

- NeuralTractUnit.py

6.9 PointProcessGenerator.PointProcessGenerator Class Reference

classdocs

Public Member Functions

- def __init__

  Constructor.
- def atualizeGenerator

Public Attributes

- GammaOrder
- GammaOrderInv
- index
- threshold
- points
- y

6.9.1 Detailed Description

classdocs

Definition at line 30 of file PointProcessGenerator.py.

6.9.2 Constructor & Destructor Documentation

6.9.2.1 def PointProcessGenerator.PointProcessGenerator.__init__ (*self, GammaOrder, index*)

Constructor.

Definition at line 36 of file PointProcessGenerator.py.

6.9.3 Member Function Documentation

6.9.3.1 def PointProcessGenerator.PointProcessGenerator.atualizeGenerator (*self, t, FR*)

Definition at line 48 of file PointProcessGenerator.py.

6.9.4 Member Data Documentation

6.9.4.1 PointProcessGenerator.PointProcessGenerator.GammaOrder

Definition at line 38 of file PointProcessGenerator.py.

6.9.4.2 PointProcessGenerator.PointProcessGenerator.GammaOrderInv

Definition at line 39 of file PointProcessGenerator.py.

6.9.4.3 PointProcessGenerator.PointProcessGenerator.index

Definition at line 40 of file PointProcessGenerator.py.

6.9.4.4 PointProcessGenerator.PointProcessGenerator.points

Definition at line 45 of file PointProcessGenerator.py.

6.9.4.5 PointProcessGenerator.PointProcessGenerator.threshold

Definition at line 44 of file PointProcessGenerator.py.

6.9.4.6 PointProcessGenerator.PointProcessGenerator.y

Definition at line 54 of file PointProcessGenerator.py.

The documentation for this class was generated from the following file:

- PointProcessGenerator.py

6.10 PulseConductanceState.PulseConductanceState Class Reference

Public Member Functions

- def __init__

  Initializes the pulse conductance state.
- def changeState

void function that modify the current situation (true/false) of the state

- def computeStateValue

  compute the state value by using the approximation of Destexhe (1997) to compute the Hodgkin-Huxley states.

Public Attributes

- kind
- value
- v0
- t0
- state
- beta_ms1
- alpha_ms1
- PulseDur_ms
- actType
- computeValueOn
- computeValueOff

6.10.1 Detailed Description

Definition at line 24 of file PulseConductanceState.py.

6.10.2 Constructor & Destructor Documentation

6.10.2.1 def PulseConductanceState.PulseConductanceState.__init__ (*self, kind, conf, pool, index*)

Initializes the pulse conductance state.

Variables: kind - type of the state(m, h, n, q). conf - an instance of the Configuration class with the functions to correctly parameterize the model. See the Configuration class. pool - the pool that this state belongs. index - the index of the unit that this state belongs.

Definition at line 38 of file PulseConductanceState.py.

6.10.3 Member Function Documentation

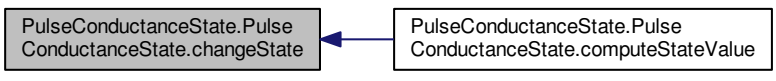
6.10.3.1 def PulseConductanceState.PulseConductanceState.changeState (*self, t*)

void function that modify the current situation (true/false) of the state

Inputs: t - instant t

Definition at line 76 of file PulseConductanceState.py.

Here is the caller graph for this function:



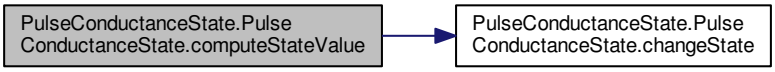
6.10.3.2 def PulseConductanceState.PulseConductanceState.computeStateValue (*self, t*)

compute the state value by using the approximation of Destexhe (1997) to compute the Hodgkin-Huxley states.

Input: t - instant t

Definition at line 87 of file PulseConductanceState.py.

Here is the call graph for this function:



6.10.4 Member Data Documentation

6.10.4.1 PulseConductanceState.PulseConductanceState.actType

Definition at line 53 of file PulseConductanceState.py.

6.10.4.2 PulseConductanceState.PulseConductanceState.alpha_ms1

Definition at line 49 of file PulseConductanceState.py.

6.10.4.3 PulseConductanceState.PulseConductanceState.beta_ms1

Definition at line 48 of file PulseConductanceState.py.

6.10.4.4 PulseConductanceState.PulseConductanceState.computeValueOff

Definition at line 63 of file PulseConductanceState.py.

6.10.4.5 PulseConductanceState.PulseConductanceState.computeValueOn

Definition at line 62 of file PulseConductanceState.py.

6.10.4.6 PulseConductanceState.PulseConductanceState.kind

Definition at line 39 of file PulseConductanceState.py.

6.10.4.7 PulseConductanceState.PulseConductanceState.PulseDur_ms

Definition at line 50 of file PulseConductanceState.py.

6.10.4.8 PulseConductanceState.PulseConductanceState.state

Definition at line 46 of file PulseConductanceState.py.

6.10.4.9 PulseConductanceState.PulseConductanceState.t0

Definition at line 44 of file PulseConductanceState.py.

6.10.4.10 PulseConductanceState.PulseConductanceState.v0

Definition at line 43 of file PulseConductanceState.py.

6.10.4.11 PulseConductanceState.PulseConductanceState.value

Definition at line 40 of file PulseConductanceState.py.

The documentation for this class was generated from the following file:

- PulseConductanceState.py

6.11 Synapse.Synapse Class Reference

classdocs

Public Member Functions

- def __init__
  Constructor.
- def computeCurrent
- def computeCurrent2
- def computeConductance
- def startConductanceNone
- def startConductanceDynamics
- def stopConductanceNone
- def stopConductanceDynamics
- def receiveSpike
- def addConductance

Public Attributes

- pool
- kind
- neuronKind
- EqPot_mV
- alpha_ms1
- beta_ms1
- Tmax_mM
- tPeak_ms
- gmax_muS
- delay_ms
- dynamics
- gMaxTot_muS
- numberOfIncomingSynapses
- rInf
- tauOn
- tauOff

- expFinish
- Non
- Ron
- ron
- Roff
- roff
- t0
- spikesReceived
- conductanceState
- tBeginOfPulse
- tEndOfPulse
- ri
- ti
- synContrib
- startDynamicFunction
- stopDynamicFunction
- startEntrance
- stopEntrance
- computeCurrent

6.11.1 Detailed Description

classdocs

Definition at line 55 of file Synapse.py.

6.11.2 Constructor & Destructor Documentation

6.11.2.1 def Synapse.Synapse.__init__ (*self, conf, pool, index, compartment, kind, neuronKind*)

Constructor.

Definition at line 62 of file Synapse.py.

6.11.3 Member Function Documentation

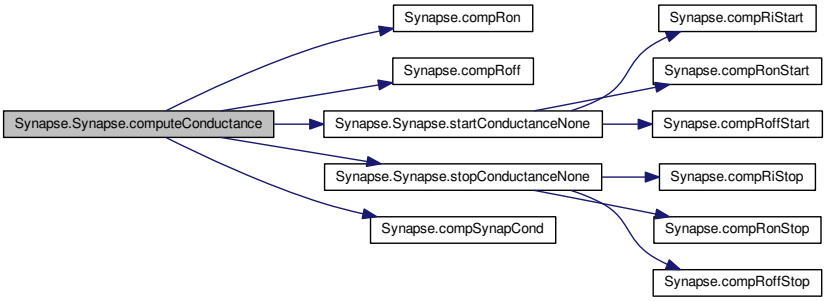
6.11.3.1 def Synapse.Synapse.addConductance (*self, gmax, delay, dynamics, weight*)

Definition at line 209 of file Synapse.py.

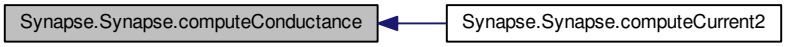
6.11.3.2 def Synapse.Synapse.computeConductance (*self, t*)

Definition at line 144 of file Synapse.py.

Here is the call graph for this function:



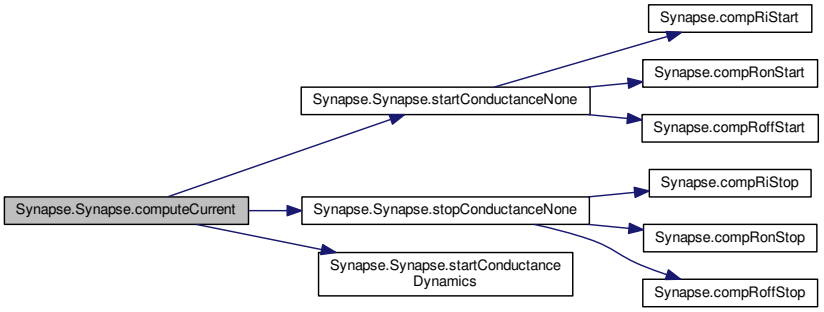
Here is the caller graph for this function:



6.11.3.3 def Synapse.Synapse.computeCurrent (*self, t, V_mV*)

Definition at line 116 of file Synapse.py.

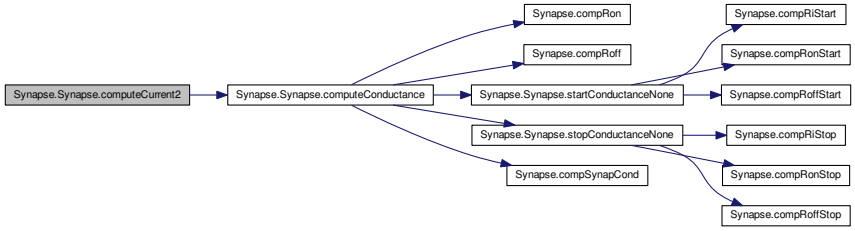
Here is the call graph for this function:



6.11.3.4 def Synapse.Synapse.computeCurrent2 (*self, t, V_mV*)

Definition at line 135 of file Synapse.py.

Here is the call graph for this function:



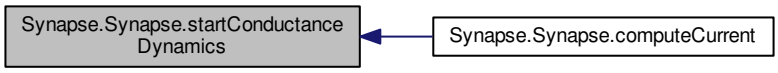
6.11.3.5 def Synapse.Synapse.receiveSpike (*self, t, synapseNumber*)

Definition at line 204 of file Synapse.py.

6.11.3.6 def Synapse.Synapse.startConductanceDynamics (*self, t, synapsesNumber*)

Definition at line 177 of file Synapse.py.

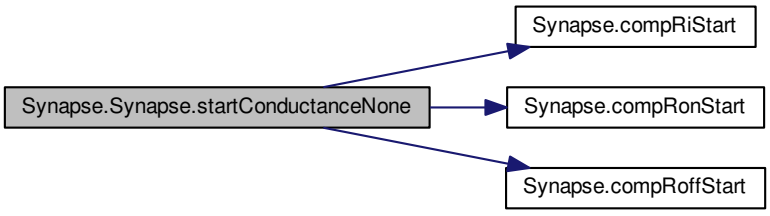
Here is the caller graph for this function:



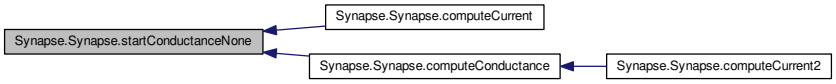
6.11.3.7 def Synapse.Synapse.startConductanceNone (*self, t, idxBeginPulse*)

Definition at line 159 of file Synapse.py.

Here is the call graph for this function:



Here is the caller graph for this function:



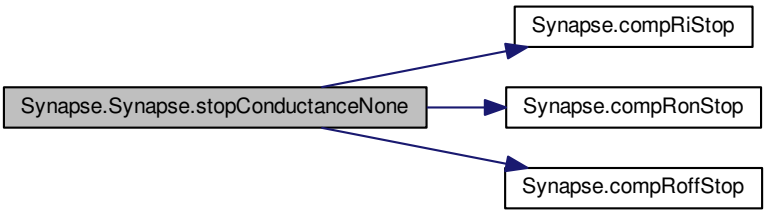
6.11.3.8 def Synapse.Synapse.stopConductanceDynamics (*self, t, synapseNumber*)

Definition at line 198 of file Synapse.py.

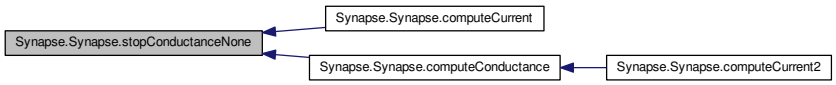
6.11.3.9 def Synapse.Synapse.stopConductanceNone (*self, t, idxEndPulse*)

Definition at line 182 of file Synapse.py.

Here is the call graph for this function:



Here is the caller graph for this function:



6.11.4 Member Data Documentation

6.11.4.1 Synapse.Synapse.alpha_ms1

Definition at line 68 of file Synapse.py.

6.11.4.2 Synapse.Synapse.beta_ms1

Definition at line 69 of file Synapse.py.

6.11.4.3 Synapse.Synapse.computeCurrent

Definition at line 129 of file Synapse.py.

6.11.4.4 Synapse.Synapse.conductanceState

Definition at line 100 of file Synapse.py.

6.11.4.5 Synapse.Synapse.delay_ms

Definition at line 75 of file Synapse.py.

6.11.4.6 Synapse.Synapse.dynamics

Definition at line 76 of file Synapse.py.

6.11.4.7 Synapse.Synapse.EqPot_mV

Definition at line 67 of file Synapse.py.

6.11.4.8 Synapse.Synapse.expFinish

Definition at line 88 of file Synapse.py.

6.11.4.9 Synapse.Synapse.gmax_muS

Definition at line 74 of file Synapse.py.

6.11.4.10 Synapse.Synapse.gMaxTot_muS

Definition at line 81 of file Synapse.py.

6.11.4.11 Synapse.Synapse.kind

Definition at line 64 of file Synapse.py.

6.11.4.12 Synapse.Synapse.neuronKind

Definition at line 65 of file Synapse.py.

6.11.4.13 Synapse.Synapse.Non

Definition at line 91 of file Synapse.py.

6.11.4.14 Synapse.Synapse.numberOfIncomingSynapses

Definition at line 82 of file Synapse.py.

6.11.4.15 Synapse.Synapse.pool

Definition at line 63 of file Synapse.py.

6.11.4.16 Synapse.Synapse.ri

Definition at line 103 of file Synapse.py.

6.11.4.17 Synapse.Synapse.rInf

Definition at line 85 of file Synapse.py.

6.11.4.18 Synapse.Synapse.Roff

Definition at line 94 of file Synapse.py.

6.11.4.19 Synapse.Synapse.roff

Definition at line 95 of file Synapse.py.

6.11.4.20 Synapse.Synapse.Ron

Definition at line 92 of file Synapse.py.

6.11.4.21 Synapse.Synapse.ron

Definition at line 93 of file Synapse.py.

6.11.4.22 Synapse.Synapse.spikesReceived

Definition at line 98 of file Synapse.py.

6.11.4.23 Synapse.Synapse.startDynamicFunction

Definition at line 106 of file Synapse.py.

6.11.4.24 Synapse.Synapse.startEntrance

Definition at line 109 of file Synapse.py.

6.11.4.25 Synapse.Synapse.stopDynamicFunction

Definition at line 107 of file Synapse.py.

6.11.4.26 Synapse.Synapse.stopEntrance

Definition at line 110 of file Synapse.py.

6.11.4.27 Synapse.Synapse.synContrib

Definition at line 105 of file Synapse.py.

6.11.4.28 Synapse.Synapse.t0

Definition at line 96 of file Synapse.py.

6.11.4.29 Synapse.Synapse.tauOff

Definition at line 87 of file Synapse.py.

6.11.4.30 Synapse.Synapse.tauOn

Definition at line 86 of file Synapse.py.

6.11.4.31 Synapse.Synapse.tBeginOfPulse

Definition at line 101 of file Synapse.py.

6.11.4.32 Synapse.Synapse.tEndOfPulse

Definition at line 102 of file Synapse.py.

6.11.4.33 Synapse.Synapse.ti

Definition at line 104 of file Synapse.py.

6.11.4.34 Synapse.Synapse.Tmax_mM

Definition at line 70 of file Synapse.py.

6.11.4.35 Synapse.Synapse.tPeak_ms

Definition at line 71 of file Synapse.py.

The documentation for this class was generated from the following file:

- Synapse.py

6.12 SynapsesFactory.SynapsesFactory Class Reference

classdocs

Public Member Functions

- def __init__

  Constructor.

Public Attributes

- numberOfSynapses

6.12.1 Detailed Description

classdocs

Definition at line 15 of file SynapsesFactory.py.

6.12.2 Constructor & Destructor Documentation

6.12.2.1 def SynapsesFactory.SynapsesFactory.__init__ (*self, conf, pools*)

Constructor.

Definition at line 22 of file SynapsesFactory.py.

6.12.3 Member Data Documentation

6.12.3.1 SynapsesFactory.SynapsesFactory.numberOfSynapses

Definition at line 24 of file SynapsesFactory.py.

The documentation for this class was generated from the following file:

- SynapsesFactory.py

Chapter 7

File Documentation

7.1 AxonDelay.py File Reference

Classes

- class AxonDelay.AxonDelay

  Class that implements a delay correspondent to the nerve.

Namespaces

- AxonDelay

7.2 ChannelConductance.py File Reference

Classes

- class ChannelConductance.ChannelConductance

  Class that implements a model of the ionic Channels in a compartment.

Namespaces

- ChannelConductance

7.3 Compartment.py File Reference

Classes

- class Compartment.Compartment

  classdocs

Namespaces

- Compartment

Functions

- def Compartment.calcGLeak

  computes the leak conductance of the compartment input: area: area of the compartment in cm2 specificRes: specific resistance of the compartment in Ohm.cm2 output: gLeak in MS

7.4 Configuration.py File Reference

Classes

- class Configuration.Configuration

  Class that builds an object of Configuration, based on a configuration file.

Namespaces

- Configuration

7.5 MotorUnit.py File Reference

Classes

- class MotorUnit.MotorUnit

  Class that implements a motor unit model.

Namespaces

- MotorUnit

Functions

- def MotorUnit.calcGCoupling

  Calculates the coupling conductance between two compartments.
- def MotorUnit.compGCouplingMatrix

  Computes the Coupling Matrix to be used in the dVdt function of the N compartments of the motor unit.
- def MotorUnit.runge_kutta

  Function to implement the fourth order Runge-Kutta Method to solve numerically a differential equation.

7.6 MotorUnitPool.py File Reference

Classes

- class MotorUnitPool.MotorUnitPool

  classdocs

Namespaces

- MotorUnitPool

Functions

- def MotorUnitPool.twitchSaturation
- def MotorUnitPool.computeForce

7.7 NeuralTract.py File Reference

Classes

- class NeuralTract.NeuralTract

  classdocs

Namespaces

- NeuralTract

7.8 NeuralTractUnit.py File Reference

Classes

- class NeuralTractUnit.NeuralTractUnit

  classdocs

Namespaces

- NeuralTractUnit

7.9 PointProcessGenerator.py File Reference

Classes

- class PointProcessGenerator.PointProcessGenerator

  classdocs

Namespaces

- PointProcessGenerator

Functions

- def PointProcessGenerator.gammaPoint

7.10 PulseConductanceState.py File Reference

Classes

- class PulseConductanceState.PulseConductanceState

Namespaces

- PulseConductanceState

Functions

- def PulseConductanceState.compValOn
- def PulseConductanceState.compValOff

7.11 simulation.py File Reference

Namespaces

- simulation

Functions

- def simulation.simulador

7.12 Synapse.py File Reference

Classes

- class Synapse.Synapse

  classdocs

Namespaces

- Synapse

Functions

- def Synapse.compSynapCond
- def Synapse.compRon
- def Synapse.compRoff
- def Synapse.compRiStart
- def Synapse.compRiStop
- def Synapse.compRonStart
- def Synapse.compRoffStart
- def Synapse.compRonStop
- def Synapse.compRoffStop

7.13 SynapsesFactory.py File Reference

Classes

- class SynapsesFactory.SynapsesFactory

  classdocs

Namespaces

- SynapsesFactory

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