DRM Documentation

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Michele D'Asaro, Umut Guclu, Marcel van Gerven

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DRM

1.1 DRM package

1.1.1 Subpackages

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1.1.2 Submodules

class DRM.base.**DRM**(*drm_net*)

Bases: object

wrapper object that trains and analyses the model at hand

estimate(*data_iter*, *val_iter=None*, *n_epochs=1*, *cutoff=None*)

Estimation via truncated backprop

Parameters

- **data_iter** – iterator which generates sensations/responses at some specified resolution
- **val_iter** – optional iterator which generates sensations/responses at some specified resolution used for validation
- **n_epochs** – number of training epochs
- **cutoff** – cutoff for truncated backpropagation

Returns train loss and validation loss

forward(*data_iter*)

Forward propagation

Parameters **data_iter** –

Returns generated response and population activity

class DRM.base.**DRMLoss**

Bases: torch.nn.modules.module.Module

MSE loss which ignores missing data

forward(*prediction*, *target*)

Computes loss on a prediction and a target

Computes MSE loss but ignores those terms where the target is equal to nan, indicating missing data.

Parameters

- **prediction** (*Variable*) – Prediction of output
- **target** (*Variable*) – Target output

Returns MSE loss

Return type Variable

class DRM.base.**DRMNet**(*populations*, *ws*, *Wp*, *readout*)
Bases: torch.nn.modules.container.Sequential

detach_()
Detach gradients for truncation

forward(*x*)
Forward propagation

Parameters **x** – sensory input at this point in time (zeros for no input); numpy array

Returns predicted output measurements

reset()
Reset states of model components

class DRM.base.**DRMNode**(*n_in=1*, *n_out=1*)
Bases: torch.nn.modules.module.Module

Base class for populations, readouts and connections

detach_()

forward(*x*)
Forward pass for this node

Parameters **x** – input data

Returns output data

reset()
The function that is called when resetting internal state

class DRM.connection.**DRMConnection**(*n_in=1*, *n_out=1*, *delay=1*)
Bases: *DRM.base.DRMNode*

detach_()
Detach gradients for truncation

forward(*x*)
Forward propagation

Parameters **x** – input to connection

Returns connection output

reset()
Reset state

class DRM.iterators.**DRMIterator**(*resolution*, *stimulus*, *stim_time*, *response=None*, *resp_time=None*, *batch_size=None*, *n_batches=None*)
Bases: object

__iter__()
Initializes data generator. Should be invoked at the start of each epoch

Returns self

is_final()
Flags if final iteration is reached

Returns boolean if final batch is reached

next()
Produces next data item

Returns dictionary containing the stimulus and the response as torch variables

class DRM.population.**DRMPopulation**(*n_in=1*, *n_out=1*, *delay=1*)
Bases: *DRM.base.DRMNode*

forward(*x*)
Forward propagation

Parameters **x** (*list of afferent population outputs*) – population input

Returns population output

class DRM.readout.**DRMReadout**(*n_in=1*, *n_out=1*)
Bases: *DRM.base.DRMNode*

forward(*x*)
Forward propagation

Parameters **x** (*list of afferent population outputs*) – readout input

Returns predicted measurements

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