

lolimot

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lolimot > lolimot_estim

lolimot_estim

Computes the Lolimot estimation for a given vector

Syntax

```
f = lolimot_estim(x, lolModel)
```

Parameters

x

a vector of coordinates where you want to compute the derivative.

lolModel

a Lolimot structure learnt via the `lolimot_learn()` function. It handles the definition of a model.

f

the value of the Lolimot model estimation.

Description

This function computes the estimation of a given input vector for a given learnt model. See `testLolimot.sce` in the demos directory.

See Also

- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_write](#) — Saves a Lolimot model in a file
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Authors

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lolimot > lolimot_learn

lolimot_learn

Learns a Lolimot model for a given inputs/output data set

Syntax

```
[modelOut, stat] = lolimot_learn(data, sigma, nbpart, maximp, nbCut, vec, Log, modelIn, f
```

Parameters

data

the learning data set. The first columns of the data set contain the inputs and the last column contains the output.

sigma

The value of the smoothing parameter. Usually, a value of 0.33 (default value) is a good start.

nbpart

Number of partition to generate. You always should have `size(data,1)` greater than `nbpart`.

maximp

If the relative residual improvement is below `maximp`, we stop the learning process. If you want a Lolimot model with a given number of partitions, set `maximp` to 0. Otherwise, a value of 0.05 is a good start.

nbCut

the number of division with respect to dimension which are tested. If `nbCut = 2` then, we will cut each dimension in two halves. If `nbCut = 3` then, we will test a 1/3 - 2/3 cut then, we will test a 2/3 - 1/3 cut. We do this for every dimension and then we retain the best cutting. Usually, `nbCut = 2` or `3` is a good start.

vec

a boolean which tell the learning method to use `lolimot_estim_vec()` during the learning process (if `vec` is set to true) or `lolimot_estim()` (if `vec` is set to false).

Log

if set to true, some messages are printed on the console during the learning phase.

modelIn

if not empty, we will continue the learning phase of the Lolimot model contained in `modelIn` (`modelIn` must a lolimot structure). The structure contains:

- `modelIn('nbdim')`: the number of inputs

- `modelIn('sigma')`: the value of the smoothing coefficient
- `modelIn('listofmod')`: a matrix `NbPartitions x NbDim+1` which contains the linear model for each partition
- `modelIn('listofcutinf')`: the lower boundary of each partition
- `modelIn('listofcutplus')`: the upper boundary of each partition
- `modelIn('listofresidual')`: the learning residual associated to each partition
- `modelIn('residual')`: the global residual associated to the Lolimot model

pLinear

replace the exponential membership function by a piecewise linear function.

modelOut

this structure contains the learnt Lolimot model.

stat

this structure contains some statistical informations related to the learning phase.

- `stat(i)(1)` contains the residual at iteration `i`.
- `stat(i)(2)` contains the time required for adding 1 partition at iteration `i`.
- `stat(i)(3)` contains the number of partition which has been cut.
- `stat(i)(4)` contains the number of dimension which has been cut.

Description

This function allows to learn a Lolimot model given a learning data set.

See Also

- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_write](#) — Saves a Lolimot model in a file
- [lolimot_read](#) — Read a Lolimot model
- [lolimot_plot_part](#) — Plot the Lolimot cuts for a 2D model
- [lolimot_update](#) — The function update the linear models of a given Lolimot model for a given learning data set
- [lolimot_export_model](#) — Exports a Lolimot model to a `.sci` file

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lolimot > lolimot_estim_der

lolimot_estim_der

Analytical Lolimot derivative of a learnt model

Syntax

```
f = lolimot_estim_der(x, lolModel)
```

Parameters

x

a vector of coordinates where you want to compute the derivative.

lolModel

a Lolimot structure learnt via the `lolimot_learn()` function. It handles the definition of a model.

f

the value of the analytical derivative of the Lolimot model.

Description

This function computes the analytical derivative of a Lolimot model. See `testLolimot.sce` in the demos directory.

See Also

- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
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- [lolimot_read](#) — Read a Lolimot model
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`lolimot` > `lolimot_estim_vec`

lolimot_estim_vec

Computes the Lolimot estimation for a given vector

Syntax

```
f = lolimot_estim_vec(x, lolModel)
```

Parameters

x

a vector of coordinates where you want to compute the derivative.

lolModel

a Lolimot structure learnt via the `lolimot_learn()` function. It handles the definition of a model.

f

the value of the Lolimot model estimation.

Description

This function computes the estimation of a given input vector for a given learnt model. See `testLolimot.sce` in the demos directory. Compared to `lolimot_estim()`, this function is faster but uses more memory.

See Also

- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_write](#) — Saves a Lolimot model in a file
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lolimot > lolimot_learn_valid

lolimot_learn_valid

Learns a Lolimot model for a given inputs/output data set and using a validation data set

Syntax

```
[modelOut, stat] = lolimot_learn_valid(data_learn, data_valid, sigma, nbpart, maximp, nbCut, vec, Log, modelIn)
```

Parameters

data_learn

the learning data set. The first columns of the data set contain the inputs and the last column contains the output.

data_valid

the validation data set. The first columns of the data set contain the inputs and the last column contains the output. The learning phase will stop when the residual computed on the validation data set will start to rise.

sigma

The value of the smoothing parameter. Usually, a value of 0.33 (default value) is a good start.

nbpart

Number of partition to generate. You always should have `size(data,1)` greater than `nbpart`.

maximp

If the relative residual improvement is below `maximp`, we stop the learning process. If you want a Lolimot model with a given number of partitions, set `maximp` to 0. Otherwise, a value of 0.05 is a good start.

nbCut

the number of division with respect to dimension which are tested. If `nbCut = 2` then, we will cut each dimension in two halves. If `nbCut = 3` then, we will test a 1/3 - 2/3 cut then, we will test a 2/3 - 1/3 cut. We do this for every dimension and then we retain the best cutting. Usually, `nbCut = 2` or `3` is a good start.

vec

a boolean which tell the learning method to use `lolimot_estim_vec()` during the learning process (if `vec` is set to true) or `lolimot_estim()` (if `vec` is set to false).

Log

if set to true, some messages are printed on the console during the learning phase.

modelIn

if not empty, we will continue the learning phase of the Lolimot model contained in `modelIn` (`modelIn` must a lolimot structure). The structure contains:

- `modelIn('nbdim')`: the number of inputs
- `modelIn('sigma')`: the value of the smoothing coefficient
- `modelIn('listofmod')`: a matrix `NbPartitions x NbDim+1` which contains the linear model for each partition
- `modelIn('listofcutinf')`: the lower boundary of each partition
- `modelIn('listofcutplus')`: the upper boundary of each partition

- `modelIn('listofresidual')`: the learning residual associated to each partition
- `modelIn('residual')`: the global residual associated to the Lolimot model

pLinear

replace the exponential membership function by a piecewise linear function.

modelOut

this structure contains the learnt Lolimot model.

stat

this structure contains some statistical informations related to the learning phase.

- `stat(i)(1)` contains the residual at iteration `i`
- `stat(i)(2)` contains the time required for adding 1 partition at iteration `i`
- `stat(i)(3)` contains the number of partition which has been cut
- `stat(i)(4)` contains the number of dimension which has been cut

Description

This function allows to learn a Lolimot model given a learning data set. The learning process stops when the residual computed on the validation data set starts to rise.

See Also

- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_write](#) — Saves a Lolimot model in a file
- [lolimot_read](#) — Read a Lolimot model
- [lolimot_plot_part](#) — Plot the Lolimot cuts for a 2D model
- [lolimot_update](#) — The function update the linear models of a given Lolimot model for a given learning data set

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lolimot > lolimot_write

lolimot_write

Saves a Lolimot model in a file

Syntax

```
err = lolimot_write(Filename, lolModel)
```

Parameters

Filename

the file name of the Lolimot model to be saved

lolModel

the Lolimot structure which contains the Lolimot model to be saved

err

an error flag (the same meaning as with the mopen functions).

Description

This function allows to save a previously learnt Lolimot model in a file.

See Also

- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_read](#) — Read a Lolimot model
- [lolimot_export_model](#) — Exports a Lolimot model to a .sci file
- [lolimot_plot_part](#) — Plot the Lolimot cuts for a 2D model

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[lolimot](#) > [lolimot_read](#)

lolimot_read

Read a Lolimot model

Syntax

```
[err, modelOut] = lolimot_read(Filename)
```

Parameters

Filename

the name of a Lolimot model

err

an error flag (the same meaning as with the mopen functions).

modelOut

a Lolimot structure which contains the read Lolimot model.

Description

This functions allows to read a previously saved Lolimot model.

See Also

- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
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`lolimot` > `lolimot_plot_part`

lolimot_plot_part

Plot the Lolimot cuts for a 2D model

Syntax

```
lolimot_plot_part(lolModel, lol_title)
```

Parameters

lolModel

the Lolimot structure which contains the informations related to the partitions to plot. Works only for 2D models.

lol_title

the title of the graphics.

Description

This function plots the cutting of a 2D Lolimot model.

See Also

- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_write](#) — Saves a Lolimot model in a file
- [lolimot_read](#) — Read a Lolimot model
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- [lolimot_export_model](#) — Exports a Lolimot model to a .sci file

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[lolimot](#) > [lolimot_update](#)

lolimot_update

The function update the linear models of a given Lolimot model for a given learning data set

Syntax

```
modelOut = lolimot_update(data, lolModel, vec)
```

Parameters

data

the learning data set. The first columns of the data set contain the inputs and the last column contains the output.

lolModel

a Lolimot structure which contains the Lolimot model to be updated

vec

a boolean which tell the learning method to use `lolimot_estim_vec()` during the learning process (if `vec` is set to true) or `lolimot_estim()` (if `vec` is set to false).

modelOut

this structure contains the learnt Lolimot model.

Description

This function update the linear models associated to a given Lolimot model with a given data set.

See Also

- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn](#) — Learns a Lolimot model for a given inputs/output data set
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_write](#) — Saves a Lolimot model in a file
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- [lolimot_plot_part](#) — Plot the Lolimot cuts for a 2D model

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`lolimot` > `lolimot_export_model`

lolimot_export_model

Exports a Lolimot model to a .sci file

Syntax

```
err = lolimot_export_model(pathfilename, lolModel, file_type)
```

Parameters

pathfilename

Path and filename in which the function must be recorded. The file extension is forced to ".sci" or to ".m". The basename of the file name is used as function/model name.

lolModel

a structure which contains the Lolimot model.

file_type

'scilab' or 'matlab'. The type of file which is to be generated.

err

if a problem occurred during the creation of the file, err is set to %T.

Description

This function exports a Lolimot model into a .sci file.

See Also

- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_write](#) — Saves a Lolimot model in a file
- [lolimot_read](#) — Read a Lolimot model
- [lolimot_plot_part](#) — Plot the Lolimot cuts for a 2D model
- [lolimot_update](#) — The function update the linear models of a given Lolimot model for a given learning data set
- [lolimot_export_der_model](#) — Exports the partial derivative of a Lolimot model into a .sci file

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History

Version	Description
2.1	pathfilename is now a path+file name that can now point to any location. The base name is used as model name.

`lolimot` > `lolimot_export_der_model`

lolimot_export_der_model

Exports the partial derivative of a Lolimot model into a .sci file

Syntax

```
err = lolimot_export_der_model(pathfilename, lolModel, file_type)
```

Parameters

pathfilename

Path and filename in which the function must be recorded. The file extension is forced to ".sci" or to ".m". The basename of the file name is used as function/model name.

lolModel

a structure which contains the Lolimot model.

file_type

'scilab' or 'matlab'. The type of file which is to be generated.

err

if a problem occurred during the creation of the file, err is set to %T.

Description

This function exports a the partial derivative of model of a Lolimot model into a .sci file.

See Also

- [lolimot_estim_der](#) — Analytical Lolimot derivative of a learnt model
- [lolimot_estim](#) — Computes the Lolimot estimation for a given vector
- [lolimot_estim_vec](#) — Computes the Lolimot estimation for a given vector
- [lolimot_learn_valid](#) — Learns a Lolimot model for a given inputs/output data set and using a validation data set
- [lolimot_write](#) — Saves a Lolimot model in a file
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