

# Package ‘slfm’

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**Type** Package

**Title** Tools for fitting sparse latent factor model

**Version** 0.1

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## Description

slfm is a set of tools to find coherent patterns in microarray data using a Bayesian sparse latent factor model. Considerable effort has been put into making slfm fast and memory efficient, turning it an interesting alternative to simpler methods in terms of execution time.

**URL** <https://github.com/jdanielnd/slfm>

**Depends** R (>= 3.1.0)

**Imports** Rcpp (>= 0.11.0), coda

**LinkingTo** Rcpp, RcppArmadillo

**License** GPL-2

**NeedsCompilation** yes

**Repository** CRAN

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 slfm-package

*slfm: the sparse latent factor model package for R.*


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### Description

slfm is a set of tools to fit sparse latent factor models to microarray data. This includes functions to:

### Details

\* pre-process a set of matrices \* fit models to a set of matrices \* detailed summary of model fit

Considerable effort has been put into making slfm fast and memory efficient, so as slfm is an attractive alternative to simpler methods in terms of execution time.

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 process\_matrix

*Pre-process data for SLFM*


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### Description

This function pre-process the data to be used for fitting a sparse latent factor model.

### Usage

```
process_matrix(path, output_path, sample_size)
```

### Arguments

path	path containing the set of matrices to be processed
output_path	path to save the processed matrices
sample_size	number of matrices to be used on the principal component analysis

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 slfm

*Sparse Latent Factor Model*


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### Description

This function is used to fit a Bayesian sparse latent factor model.

### Usage

```
slfm(x, ite, a = 2.1, b = 1.1, gamma_a = 1, gamma_b = 1, omega = 10,
     omega_1 = 0.01, burnin = round(0.25 * ite))
```

**Arguments**

x	matrix with the pre-processed data
ite	number of iterations of the MCMC algorithm
a	prior shape parameter for Gamma distribution
b	prior scale parameter for Gamma distribution
gamma_a	prior parameter for Beta distribution
gamma_b	prior parameter for Beta distribution
omega	prior variance of the slab component
omega_1	prior variance of the spike component
burnin	burn-in size

**Value**

x: data matrix  
 p\_star: matrix of MCMC chains for p\_star parameter  
 alpha: summary table of MCMC chains for alpha parameter  
 lambda: summary table of MCMC chains for lambda parameter  
 sigma: summary table of MCMC chains for sigma parameter  
 classification: classification of each alpha ('present', 'marginal', 'absent')

**Examples**

```
mat <- matrix(rnorm(2000), nrow = 20)
slfm(mat, ite = 1000)
```

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slfm\_list

*Fit SLFM to the matrices inside a directory*


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**Description**

This function is used to fit a Bayesian sparse latent factor model to a directory of numeric matrices.

**Usage**

```
slfm_list(path = ".", recursive = TRUE, ite, a = 2.1, b = 1.1,
  gamma_a = 1, gamma_b = 1, omega = 10, omega_1 = 0.01, burnin = 500)
```

**Arguments**

<code>path</code>	path to read the matrices from
<code>recursive</code>	if the function should look recursively inside folders
<code>ite</code>	number of iterations of the MCMC algorithm
<code>a</code>	prior shape parameter for Gamma distribution
<code>b</code>	prior scale parameter for Gamma distribution
<code>gamma_a</code>	prior parameter for Beta distribution
<code>gamma_b</code>	prior parameter for Beta distribution
<code>omega</code>	prior variance of the slab component
<code>omega_1</code>	prior variance of the spike component
<code>burnin</code>	burn-in size

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