

Package ‘SVMDO’

January 20, 2026

Title Identification of Tumor-Discriminating mRNA Signatures via
Support Vector Machines Supported by Disease Ontology

Version 1.10.0

Date 2024-08-30

Depends R(>= 4.4), shiny (>= 1.7.4)

Imports shinyFiles (>= 0.9.3), shinytitle (>= 0.1.0), golem (>= 0.3.5), nortest (>= 1.0-4), e1071 (>= 1.7-12), BSDA (>= 1.2.1), data.table (>= 1.14.6), sjmisc (>= 2.8.9), klaR (>= 1.7-1), caTools (>= 1.18.2), caret (>= 6.0-93), survival (>= 3.4-0), DT (>= 0.33.0), DOSE (>= 3.24.2), AnnotationDbi (>= 1.60.0), org.Hs.eg.db (>= 3.16.0), dplyr (>= 1.0.10), SummarizedExperiment (>= 1.28.0), grDevices, graphics, stats, utils

Description It is an easy-to-use GUI using disease information for detecting tumor/normal sample discriminating gene sets from differentially expressed genes. Our approach is based on an iterative algorithm filtering genes with disease ontology enrichment analysis and wilk and wilks lambda criterion connected to SVM classification model construction. Along with gene set extraction, SVMDO also provides individual prognostic marker detection. The algorithm is designed for FPKM and RPKM normalized RNA-Seq transcriptome datasets.

RoxygenNote 7.3.2

biocViews GeneSetEnrichment, DifferentialExpression, GUI, Classification, RNASeq, Transcriptomics, Survival

NeedsCompilation no

License GPL-3

Encoding UTF-8

Roxygen list(markdown = TRUE)

Suggests BiocStyle, knitr, rmarkdown, testthat (>= 3.1.6)

VignetteBuilder knitr

Config/testthat/edition 3

BugReports <https://github.com/robogeno/SVMDO/issues>

git_url <https://git.bioconductor.org/packages/SVMDO>

git_branch RELEASE_3_22

git_last_commit 86871da

git_last_commit_date 2025-10-29

Repository Bioconductor 3.22

Date/Publication 2026-01-19

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clinic_data_input_server
SVMDO

Description

SVMDO

Usage

```
innerServer_clinic(input, output, session)
```

Arguments

input	server input
output	server output
session	server session

Value

Server section of loading clinical data

clinic_data_input_ui SVMDO

Description

SVMDO

Usage

```
innerUI_clinic_data(id)
```

Arguments

id	connection input
----	------------------

Value

UI section of loading clinical data

deg_server	<i>SVMDO</i>
------------	--------------

Description

SVMDO

Usage

innerServer_3(input, output, session, rawData, rval)

Arguments

- | | |
|---------|--|
| input | server input |
| output | server output |
| session | server session |
| rawData | expression dataset provided from innerServer_exp_server |
| rval | Selected radio button information provided from innerServer_rad_server |

Value

Server section of differential gene expression analysis

deg_ui	<i>SVMDO</i>
--------	--------------

Description

SVMDO

Usage

innerUI_deg_analysis(id)

Arguments

- | | |
|----|------------------|
| id | connection input |
|----|------------------|

Value

UI section of differential gene expression analysis

disc_gene_download_ui	<i>SVMDO</i>
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Description

SVMDO

Usage

disc_gene_download_ui(id)

Arguments

id	connection input
----	------------------

Value

UI section of discriminative gene set download button

disc_gene_dw_server	<i>SVMDO</i>
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Description

SVMDO

Usage

disc_gene_dw_server(input, output, session, gene_list_val)

Arguments

input	server input
output	server output
session	server session
gene_list_val	discriminative gene set list variable

Value

Server section of discriminative gene set download button

do_based_gene_filtration_server
SVMDO

Description

SVMDO

Usage

```
innerServer_6(input, output, session)
```

Arguments

input	server input
output	server output
session	server session

Value

Server section of disease ontology based filtration of differentially expressed genes

do_based_gene_filtration_ui
SVMDO

Description

SVMDO

Usage

```
innerUI_disease_ont_class(id)
```

Arguments

id	connection input
----	------------------

Value

UI section of disease ontology based filtration of differentially expressed genes

expression_dataset_input_server
SVMDO

Description

SVMDO

Usage

```
innerServer_exp(input, output, session)
```

Arguments

input	server input
output	server output
session	server session

Value

Server section of providing expression dataset

gene_directory_selection_server
SVMDO

Description

SVMDO

Usage

```
innerServer(input, output, session)
```

Arguments

input	server input
output	server output
session	server session

Value

Server section of entering output/working for gene list directory

gene_directory_selection_ui
SVMDO

Description

SVMDO

Usage

innerUI_path(id)

Arguments

id	connection input
----	------------------

Value

UI section of entering output/working for gene list directory

gene_list_name_server SVMDO

Description

SVMDO

Usage

innerServer_10(input, output, session)

Arguments

input	server input
output	server output
session	server session

Value

Server section of entering final gene list name

gene_list_name_ui	SVMDO
Description SVMDO	
Usage innerUI_gene_names(id)	
Arguments id connection input	
Value UI section of entering top gene value	
gene_list_table_visualization_ui	SVMDO
Description SVMDO	
Usage deg_data_table_ui(id)	
Arguments id connection input	
Value Providing table form of discriminative gene sets in GUI	
globals	SVMDO
Description SVMDO	
Value Including script files and global variables of GUI required to be initiated at the runApp file execution	

gui_obj_removal_server	<i>SVMDO</i>
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Description

SVMDO

Usage

innerServer_9(input, output, session)

Arguments

input	server input
output	server output
session	server session

Value

Server section of workspace clearance

gui_obj_removal_ui	<i>SVMDO</i>
--------------------	--------------

Description

SVMDO

Usage

innerUI_clear_env(id)

Arguments

id	connection input
----	------------------

Value

UI section of workspace clearance

innerServer_exp_ui	<i>SVMDO</i>
--------------------	--------------

Description

SVMDO

Usage

innerUI_exp_data(id)

Arguments

id	connection input
----	------------------

Value

UI section of providing expression dataset into GUI

package_req_list	<i>SVMDO</i>
------------------	--------------

Description

SVMDO

Value

List of packages involved in SVMDO

plot_list_server	<i>SVMDO</i>
------------------	--------------

Description

SVMDO

Usage

plot_list_server(input, output, session)

Arguments

input	server input
output	server output
session	server session

Value

Server section of preparing plot list to be visualized in GUI page

plot_list_ui	<i>SVMDO</i>
--------------	--------------

Description

SVMDO

Usage

```
innerUI_collect_plot_data(id)
```

Arguments

id	connection output
----	-------------------

Value

UI section of preparing plot list to be visualized in GUI page

plot_push_server	<i>SVMDO</i>
------------------	--------------

Description

SVMDO

Usage

```
plot_push_server(input, output, session)
```

Arguments

input	server input
output	server output
session	server session

Value

Server section of providing information about total number of survival plots for visualization

plot_push_ui	<i>SVMDO</i>
--------------	--------------

Description

SVMDO

Usage

innerUI_plot_inject(id)

Arguments

id	connection input
----	------------------

Value

UI section of providing information about total number of survival plots for visualization

plot_show_server	<i>SVMDO</i>
------------------	--------------

Description

SVMDO

Usage

plot_show_server(input, output, session, max_data)

Arguments

input	server input
output	server output
session	server session
max_data	Information of total number of survival plots prepared with discriminative gene set

Value

Server section of providing information about total number of survival plots for visualization

plot_show_ui	<i>SVMDO</i>
--------------	--------------

Description

SVMDO

Usage

```
innerUI_plot_show(id)
```

Arguments

id	connection input
----	------------------

Value

UI section of providing information about total number of survival plots for visualization

runGUI	<i>SVMDO</i>
--------	--------------

Description

SVMDO

Usage

```
linebreaks(n)
```

Arguments

n	linebreak function variable
---	-----------------------------

Value

Returning GUI window screen

Examples

```
#SVMDO::runGUI() Calling GUI without activating library
#runGUI() Calling GUI after activating library
# Disease Ontology Enrichment of a differentially expressed gene (entrez id):
a_1<-DOSE::enrichD0(2981,ont="HDO")
```

survival_analysis_server
<i>SVMDO</i>

Description

SVMDO

Usage

innerServer_8(input, output, session, rawData_2, rval)

Arguments

input	server input
output	server output
session	server session
rawData_2	Clinical data provided from clinic_data_input_server
rval	Selected radio button information provided from innerServer_rad_server

Value

Server section of survival analysis of final discriminative gene set

survival_analysis_ui	<i>SVMDO</i>
----------------------	--------------

Description

SVMDO

Usage

innerUI_surv(id)

Arguments

id	connection input
----	------------------

Value

UI section of survival analysis of final discriminative gene set

surv_plot_dw_server	<i>SVMDO</i>
---------------------	--------------

Description

SVMDO

Usage

```
surv_plot_dw_server(input, output, session)
```

Arguments

input	server input
output	server output
session	server session

Value

Server section of downloading survival plots of discriminative gene set

surv_plot_dw_ui	<i>SVMDO</i>
-----------------	--------------

Description

SVMDO

Usage

```
surv_plots_download_ui(id)
```

Arguments

id	connection input
----	------------------

Value

UI section of downloading survival plots of discriminative gene set

table_server	<i>SVMDO</i>
--------------	--------------

Description

SVMDO

Usage

table_server(input, output, session)

Arguments

input	server input
output	server output
session	server session

Value

Server section of providing discriminative gene set for preparing table

table_ui	<i>SVMDO</i>
----------	--------------

Description

SVMDO

Usage

innerUI_table_show(id)

Arguments

id	connection input
----	------------------

Value

UI section of providing discriminative gene set for preparing table

test_data_selection_server
SVMDO

Description

SVMDO

Usage

innerServer_rad(input, output, session)

Arguments

input	server input
output	server output
session	server session

Value

Server section of providing information about selected radio button

test_data_selection_ui
SVMDO

Description

SVMDO

Usage

innerUI_test_data(id)

Arguments

id	connection input
----	------------------

Value

UI section of providing information about selected radio button

top_val_based_deg_filtration
<i>SVMDO</i>

Description

SVMDO

Usage

innerServer_5(input, output, session, top_val)

Arguments

input	server input
output	server output
session	server session
top_val	top gene number value provided from top_val_server

Value

Server section of selecting differentially expressed genes based on top gene value

top_val_based_deg_filtration_ui
<i>SVMDO</i>

Description

SVMDO

Usage

innerUI_top_gene_selection(id)

Arguments

id	connection input
----	------------------

Value

UI section of selecting differentially expressed genes based on top gene value

top_val_server	<i>SVMDO</i>
----------------	--------------

Description

SVMDO

Usage

innerServer_4(input, output, session)

Arguments

input	server input
output	server output
session	server session

Value

Server section of entering top gene value

top_val_ui	<i>SVMDO</i>
------------	--------------

Description

SVMDO

Usage

innerUI_top_gene_val(id)

Arguments

id	connection input
----	------------------

Value

UI section of entering top gene value

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