

Package ‘SVMDO’

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

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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

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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>

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classification_server *SVMDO*

Description

SVMDO

Usage

innerServer_7(input, output, session)

Arguments

| | |
|---------|----------------|
| input | server input |
| output | server output |
| session | server session |

Value

Server section of wilks lambda filtration and SVM classification of disease filtered differentially expressed gene set

classification_ui *SVMDO*

Description

SVMDO

Usage

innerUI_classification(id)

Arguments

id connection input

Value

UI section of wilks lambda filtration and SVM classification of disease filtered differentially expressed gene set

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

SVMDO

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

SVMDO

Description

SVMDO

Usage

```
innerUI_deg_analysis(id)
```

Arguments

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

Value

UI section of differential gene expression analysis

disc_gene_download_ui *SVMDO*

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 *SVMDO*

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 | <i>SVMDO</i> |
|---------|--------------|

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> |
|------------------------|--------------|

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 *SVMDO*

Description

SVMDO

Usage

innerUI_clear_env(id)

Arguments

id connection input

Value

UI section of workspace clearance

innerServer_exp_ui *SVMDO*

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 *SVMDO*

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 *SVMDO*

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::enrichDO(2981,ont="HDO")
```

survival_analysis_server
SVMDO

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 *SVMDO*

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 *SVMDO*

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 *SVMDO*

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
SVMDO

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
SVMDO

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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