Package ‘FSK2R’

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Type Package

Title An Interface Between the ‘FSK-ML’ Standard and ‘R’

Version 0.1.2

Description Functions for importing, creating, editing and exporting 'FSK' files <https://foodrisklabs.bfr.bund.de/fsk-ml-food-safety-knowledge-markup-language/> using the 'R' programming environment. Furthermore, it enables users to run simulations contained in the 'FSK' files and visualize the results.

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check_manifest_files

Checks that the files defined in the manifest exist

Description
Checks that the files defined in the manifest exist

Usage
check_manifest_files(my_manifest, file_dir)

Arguments
- my_manifest: A list with the contents of the manifest file.
- file_dir: Path to the directory where all the files have been extracted.

convert_metadata_to_lists

Fix the metadata so that it is lists

Description
Fix the metadata so that it is lists

Usage
convert_metadata_to_lists(my_metadata)

Arguments
- my_metadata: A list with the information in the GoogleSheet as generated by metadata_list_to_fsk.
create_fsk  Creates an FSK model from an existing R script

Description

The model includes the R model. If provided as arguments, it also includes the visualization script and the README. Besides, it generates a typical model_metadata, as well as a simulation (without parameters). The manifest is left empty.

Usage

```r
create_fsk(
  r_model,
  r_visualization = NULL,
  readme = NULL,
  other_files = NULL,
  pckg_frame = NULL
)
```

Arguments

- `r_model` character with the path to the R script with the model.
- `r_visualization` (optional) character with the path to the R script with the visualization.
- `readme` (optional) path to README file.
- `other_files` (optional) character vector with the path to additional files.
- `pckg_frame` (optional) data.frame with 2 columns ‘Package’ files required by the model.

Value

An instance of FSK2R.

Examples

```r
model_path <- system.file("extdata", "model.r", package = "FSK2R")
visualization_path <- system.file("extdata", "visualization.r", package = "FSK2R")
FSK_from_R <- create_fsk(model_path, visualization_path)
```
**dataframe_to_list**  
*Converts a dataframe to a list*

**Description**

This function is needed to convert the output format of rjson to the one used by FSK2R.

**Usage**

```r
dataframe_to_list(this_frame)
```

**Arguments**

- `this_frame` : data.frame to convert to a list.

---

**download_metadata_schema**

`#' Download the latest version of the MetaData Master Table as Excel`

**Description**

`#' Download the latest version of the MetaData Master Table as Excel`

**Usage**

```r
download_metadata_schema(out_path, sheet = NULL)
```

**Arguments**

- `out_path` : Character saying where to save the file.
- `sheet` : Character specifying what sheet to download. All of them by default (NULL).

**Value**

None
export_fsk

Exports an object of FSK class as an .fskx file

Description
Exports an object of FSK class as an .fskx file

Usage
export_fsk(fsk_object, out_path, check = TRUE)

Arguments
- fsk_object: The instance of FSK2R to be exported.
- out_path: Path where the file is to be saved.
- check: Whether checks are made. TRUE by default.

Value
None

Examples
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
class(my_fsk)
export_fsk(my_fsk, out_path=file.path(tempdir(), "out.fskx"))

export_manifest

Functions for exporting the manifest of an FSK2R object

Description
Functions for exporting the manifest of an FSK2R object

Usage
export_manifest(fsk_object, out_path, check = FALSE)

Arguments
- fsk_object: The instance of FSK2R to be exported.
- out_path: Path where the file is to be saved.
- check: Whether checks are made. TRUE by default.
**export_metadata**

*Function for exporting the metadata of an FSK2R object*

**Description**

Function for exporting the metadata of an FSK2R object

**Usage**

```r
eexport_metadata(fsk_object, out_path, check = FALSE)
```

**Arguments**

- `fsk_object` The instance of FSK2R to be exported.
- `out_path` Path where the file is to be saved.
- `check` Whether checks are made. TRUE by default.

**export_modelmetadata**

*Functions for exporting the model metadata of an FSK2R object*

**Description**

Functions for exporting the model metadata of an FSK2R object

**Usage**

```r
eexport_modelmetadata(fsk_object, out_path, check = FALSE)
```

**Arguments**

- `fsk_object` The instance of FSK2R to be exported.
- `out_path` Path where the file is to be saved.
- `check` Whether checks are made. TRUE by default.
export_otherfiles

Description

Export other files

Usage

export_otherfiles(fsk_object, out_path, check = FALSE)

Arguments

fsk_object  The instance of FSK2R to be exported.
out_path    Path where the file is to be saved.
check       Whether checks are made. TRUE by default.

export_packages

Description

Functions for exporting the packages of an FSK2R object

Usage

export_packages(fsk_object, out_path, check = FALSE)

Arguments

fsk_object  The instance of FSK2R to be exported.
out_path    Path where the file is to be saved.
check       Whether checks are made. TRUE by default.
export_readme

Functions for exporting the README of an FSK2R object

Description

Functions for exporting the README of an FSK2R object

Usage

```r
export_readme(fsk_object, out_path, check = FALSE)
```

Arguments

- `fsk_object` The instance of FSK2R to be exported.
- `out_path` Path where the file is to be saved.
- `check` Whether checks are made. TRUE by default.

export_R_model

Functions for exporting the R model of an FSK2R object

Description

Functions for exporting the R model of an FSK2R object

Usage

```r
export_R_model(fsk_object, out_path, check = FALSE)
```

Arguments

- `fsk_object` The instance of FSK2R to be exported.
- `out_path` Path where the file is to be saved.
- `check` Whether checks are made. TRUE by default.
**export_sbmlModel**  
*Export the model.sbml*

**Description**

Export the model.sbml

**Usage**

```r
export_sbmlModel(fsk_object, out_path, check = FALSE)
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
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<tbody>
<tr>
<td>fsk_object</td>
<td>The instance of FSK2R to be exported.</td>
</tr>
<tr>
<td>out_path</td>
<td>Path where the file is to be saved.</td>
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<tr>
<td>check</td>
<td>Whether checks are made. TRUE by default.</td>
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**export_simulation**  
*Export the sim.sedml*

**Description**

Export the sim.sedml

**Usage**

```r
export_simulation(fsk_object, out_path, check = FALSE)
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
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<tbody>
<tr>
<td>fsk_object</td>
<td>The instance of FSK2R to be exported.</td>
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export_visualization  
*Functions for exporting the visualization script of an FSK2R object*

**Description**

Functions for exporting the visualization script of an FSK2R object

**Usage**

```r
export_visualization(fsk_object, out_path, check = FALSE)
```

**Arguments**

- **fsk_object**
  - The instance of FSK2R to be exported.
- **out_path**
  - Path where the file is to be saved.
- **check**
  - Whether checks are made. TRUE by default.

---

find_packages  
*Finds where packages are stored*

**Description**

Finds where packages are stored

**Usage**

```r
find_packages(pckgs)
```

**Arguments**

- **pckgs**
  - Character vector with packages names

**Value**

A list of packages locations. If one is not present, a character(0).
**FSK_runner**  
*Startup FSK runner*

**Description**  
Starts FSK runner within RStudio.

**Usage**  
FSK_runner()

**Value**  
None

---

**get_background**  
*Returns the background of an FSK object*

**Description**  
Returns the background of an FSK object

**Usage**  
get_background(fsk_obj)

**Arguments**  
fsk_obj  
An object of class FSK2R

**Value**  
A nested list with the following entries:

* studyTitle
* studyDescription

**Examples**

```r
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_background(my_fsk)
```
get_general_info

Returns the general info of an FSK object

Description

Returns the general info of an FSK object

Usage

get_general_info(fsk_obj)

Arguments

fsk_obj An object of class FSK2R

Value

A nested list with the following entries:

- name
- source
- identifier
- creationDate
- rights
- language
- software
- creators
- reference

Examples

path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_general_info(my_fsk)
get_modelmath

Returns the model math of an FSK object

Description

Returns the model math of an FSK object

Usage

get_modelmath(fsk_obj)

Arguments

fsk_obj An object of class FSK2R

Value

A nested list with the following entries:

• parameter

Examples

path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_modelmath(my_fsk)

generate_readme

Readme of an FSK object

Description

Readme of an FSK object

Usage

get_readme(fsk_obj)

Arguments

fsk_obj An object of class FSK2R

Value

A character vector with the text in the README file.
get_scope

Examples

```r
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_readme(my_fsk)
```

*get_scope*  

*Returns the scope of an FSK object*

**Description**

Returns the scope of an FSK object

**Usage**

```r
get_scope(fsk_obj)
```

**Arguments**

- `fsk_obj`  
  An object of class FSK2R

**Value**

A nested list with the following entries:

- product
- hazard

**Examples**

```r
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_scope(my_fsk)
```
get_session_info  Extract session information

Description
Extract session information

Usage
get_session_info()

Value
A list with 3 elements: r_version, platform and pckgs. The latter is a data.frame with two columns: package and version.

get_simulations  Returns a summary of the simulations of an FSK object (NULL)

Description
The function is not in-use. It is kept here for compatibility with older versions.

Usage
get_simulations(fsk_obj)

Arguments

fsk_obj  An object of class FSK2R

import_fsk  Import an FSK model into R

Description
Importst the file in file_path and transforms it into a list of class FSK2R.

Usage
import_fsk(file_path, check = FALSE)
import_fsk_join

Arguments

file_path  Path where the file is located.
check  Whether checks are made. FALSE by default.

Value

An instance of FSK2R.

Examples

```r
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
get_general_info(my_fsk)
```

---

import_fsk_join  Import of FSK with join node

Description

Join nodes are not yet supported by FSK2R. It just gives an error message when called.

Usage

```r
import_fsk_join(file_path, check = TRUE)
```

Arguments

file_path  Path where the file is located.
check  Whether checks are made. FALSE by default.

---

is.FSK2R  Is it an instance of FSK2R?

Description

Is it an instance of FSK2R?

Usage

```r
is.FSK2R(object)
```
is_fsk_with_r

Arguments

object Object to check

Value

A logical vector

Examples

path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
is.FSK2R(my_fsk)

is_fsk_with_r  Does the object have an R model?

Description

Does the object have an R model?

Usage

is_fsk_with_r(fsk_obj)

Arguments

fsk_obj An object of class FSK2R

Value

A logical vector.

Examples

path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
is_fsk_with_r(my_fsk)
map_FSK_metadata  Map for the contents of the metadata

Description
Maps the location (range) of different pieces of data within the Excel/Google Sheets template. It also includes the names of the sheets.

Usage
map_FSK_metadata(type_of_model = "generic", fsk_version = "1.04")

Arguments
- type_of_model  Type of model, as defined in the FSK-ML documentation. By default, 'generic'.
- fsk_version  Character stating the version of FSK-ML.

Value
A list with two components: the 'range' where each piece of information is stored and 'ws_name' with the name of the relevant sheet in the GoogleSheet template.

map_metadata_xml_template  Map between the names used in the template and the xml

Description
Returns a map of the names used within the sheets of the Excel/GoogleSheets template and the ones in metadata.json.

Usage
map_metadata_xml_template()
**metadata_list_to_fsk**  
*From read_fsk_metadata_XX to FSK2R format*

**Description**  
Converts the contents of the Excel/Google Sheets template into a list with the format of the FSK2R object.

**Usage**  
```
metadata_list_to_fsk(my_metadata, fsk_version = "1.0.5")
```

**Arguments**  
- **my_metadata**: A list generated by  
- **fsk_version**: Version of the FSK template.

**n_simuls_fsk**  
*Number of simulations in the FSK2R object*

**Description**  
Number of simulations in the FSK2R object

**Usage**  
```
n_simuls_fsk(fsk_obj)
```

**Arguments**  
- **fsk_obj**: An instance of FSK2R

**Value**  
An integer vector of length one.

**Examples**  
```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
n_simuls_fsk(my_fsk)
```
**read_fsk_json_metadata**  
*Read the metadata.json file*

**Description**
Read the metadata.json file

**Usage**
```r
read_fsk_json_metadata(file_dir, check = FALSE, filename = "metaData.json")
```

**Arguments**
- `file_dir`: path to the file.
- `check`: Whether to make checks. FALSE by default.
- `filename`: Name of the file whith the information (meataData.json by default).

**Value**
A list with the contents of the metadata file.

---

**read_fsk_manifest**  
*Read the manifest of an FSK file and convert it to a data.frame*

**Description**
Read the manifest of an FSK file and convert it to a data.frame

**Usage**
```r
read_fsk_manifest(file_dir, check = FALSE, filename = "manifest.xml")
```

**Arguments**
- `file_dir`: path to the file.
- `check`: Whether to make checks. FALSE by default.
- `filename`: Name of the file whith the information (manifest.xml by default).

**Value**
A data.frame with the contents of the xml file.
read_fsk_metadata Excel

**Description**

Reads the metadata contained in a Google Sheet

**Usage**

```r
read_fsk_metadata(fsk_object, title, type_of_model = "generic")
```

**Arguments**

- `fsk_object`: FSK2R object where to save the metadata
- `title`: Character identifying the Google Sheet
- `type_of_model`: Character identifying the type of model.

**Value**

A list with the information in the GoogleSheet as generated by metadata_list_to_fsk.

---

read_fsk_metadata_excel

**Description**

FSK metadata from local Excel file

**Usage**

```r
read_fsk_metadata_excel(
    fsk_object, 
    path, 
    type_of_model = "generic", 
    fsk_version = "1.0.5"
)
```

**Arguments**

- `fsk_object`: FSK2R object where to save the data
- `path`: character describing the path to the file
- `type_of_model`: character identifying the type of model
- `fsk_version`: Character describing the version of FSK-ML ("1.04" by default).
**read_fsk_model**

**Value**
A list with the information in the Excel file as generated by metadata_list_to_fsk.

**Description**
Read the model.sbml

**Usage**

```r
read_fsk_model(file_dir, check = FALSE, filename = "model.sbml")
```

**Arguments**
- `file_dir`  path to the file.
- `check`  Whether to make checks. FALSE by default.
- `filename`  Name of the file whith the information (model.sbml by default).

**Value**
A list with the contents of the .xml file.

**read_fsk_packages**

**Description**
Read the packages.json

**Usage**

```r
read_fsk_packages(file_dir, check = FALSE, filename = "packages.json")
```

**Arguments**
- `file_dir`  path to the file.
- `check`  Whether to make checks. FALSE by default.
- `filename`  Name of the file whith the information (packages.json by default).

**Value**
A list with the contents of the JSON file.
read_fsk_rdf_metadata  Read the metadata.rdf

Description
Read the metadata.rdf

Usage
read_fsk_rdf_metadata(file_dir, check = FALSE, filename = "metadata.rdf")

Arguments
  file_dir    path to the file.
  check       Whether to make checks. FALSE by default.
  filename    Name of the file with the information (metadata.rdf by default).

Value
A list with the contents of the .xml file.

read_fsk_readme  Read the README file

Description
Read the README file

Usage
read_fsk_readme(file_dir, check = FALSE, filename = "README.txt")

Arguments
  file_dir    path to the file.
  check       Whether to make checks. FALSE by default.
  filename    Name of the file with the information (README.txt by default).

Value
A character string with the content of the README file.
**read_fsk_sim**

*Read the sim.sedml file*

### Description

Read the sim.sedml file

### Usage

```r
read_fsk_sim(file_dir, check = FALSE, filename = "sim.sedml")
```

### Arguments

- **file_dir**
  - path to the file.
- **check**
  - Whether to make checks. FALSE by default.
- **filename**
  - Name of the file whith the information (sim.sedml by default).

### Value

A list with the content of the xml file.

---

**read_other_files**

*Read "other files"*

### Description

The R models may require further files that we can not predict. This functions just reads all the "unrecognized" files included in the manifest and copies them to the working directory.

### Usage

```r
read_other_files(my_tempdir, my_manifest, check = FALSE)
```

### Arguments

- **my_tempdir**
  - Temporary directory to extract contents of the zyp file.
- **my_manifest**
  - A list with the information in the manifest file
- **check**
  - Whether checks are made.
read_R_model  
Reads the R model in an FSK model

Description

Reads the R model in an FSK model

Usage

read_R_model(file_dir, check = FALSE, filename = "model.R")

Arguments

file_dir  path to the file.
check     Whether to make checks. FALSE by default.
filename  Name of the file (model.R by default).

Value

A character string with the contents of the R file.

read_visualization  
Reads the visualization script in an FSK model

Description

Reads the visualization script in an FSK model

Usage

read_visualization(file_dir, check = FALSE, filename = "visualization.R")

Arguments

file_dir  path to the file.
check     Whether to make checks. FALSE by default.
filename  Name of the file whith the information (visualization.R by default).

Value

A character string with the contents of the R file.
**run_all_simulations**  
*Run every simulation in an FSK object*

**Description**
Runs every simulation defined in the FSK object. This includes the ones originally included in the FSK container, as well as the ones added using set_new_simulation().

**Usage**
```r
run_all_simulations(fsk_object, run_visualization = FALSE)
```

**Arguments**
- `fsk_object`: Instance of FSK2R
- `run_visualization`: Whether to call the visualization script. FALSE by default.

**Value**
None

**Examples**
```r
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
run_all_simulations(my_fsk)
```

---

**run_simulation**  
*Run one simulation in an FSK object*

**Description**
Runs the simulation corresponding to index. If defined, it also calls any visualization script.

**Usage**
```r
run_simulation(fsk_object, index, run_visualization = FALSE)
```

**Arguments**
- `fsk_object`: Instance of FSK2R
- `index`: Index of the simulation
- `run_visualization`: Whether to call the visualization script. FALSE by default.
Value
None

Examples

```r
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
run_simulation(my_fsk, 1)
```

---

**set_new_simulation**

*Define a new simulation in an FSK2R object*

**Description**

Sets a new simulation using the parameters defined in `simulation_pars`. The method updates all the relevant methods.

**Usage**

```r
set_new_simulation(fsk_object, simulation_id, parameters)
```

**Arguments**

- `fsk_object`: Instance of FSK2R
- `simulation_id`: A character with an id for the new simulation.
- `parameters`: A list whose names are the parameters to modify and their values for the simulation.

**Value**

An instance of FSK2R with the additional simulation data.
**set_readme**

Readme of an FSK object

**Description**

Readme of an FSK object

**Usage**

```
set_readme(fsk_object, readme_text)
```

**Arguments**

- `fsk_object` An instance of FSK2R.
- `readme_text` A character vector of length 1 with the content of the README file.

**Value**

An instance of FSK2R.

**Examples**

```
path_example <- system.file("extdata", "ToyModelv4.fskx", package = "FSK2R")
my_fsk <- import_fsk(path_example)
set_readme(my_fsk, "This is the README.")
```

**update_manifest**

Updates the manifest file

**Description**

Updates the manifest file

**Usage**

```
update_manifest(fsk_object)
```

**Arguments**

- `fsk_object` An instance of FSK2R.
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