Package ‘FSK2R’

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Type Package

Title An Interface Between the ‘FSKX’ Standard and ‘R’

Version 0.1.3

Description Functions for importing, creating, editing and exporting 'FSK' files <https://foodrisklabs.bfr.bund.de/fskx-food-safety-knowledge-exchange-format/> 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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Encoding UTF-8

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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 metadat so that it is lists

Description
Fix the metadat 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
- `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
dataframe_to_list(this_frame)

Arguments
this_frame data.frame to convert to a list.

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**

```r
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
export_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.
Description

Functions for exporting the model metadata of an FSK2R object

Usage

export_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.

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  
*Functions for exporting the packages of an FSK2R object*

**Description**

Functions for exporting the packages of an FSK2R object

**Usage**

```r
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**

- `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_simulation  

Export the sim.sedml

Description
Export the sim.sedml

Usage
export_simulation(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_visualization  

Functions for exporting the visualization script of an FSK2R object

Description
Functions for exporting the visualization script of an FSK2R object

Usage
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**

```r
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
get_modelmath

Value

A nested list with the following entries:

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

Examples

```r
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

```r
get_modelmath(fsk_obj)
```

Arguments

- fsk_obj

Value

A nested list with the following entries:

- parameter
get_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.

Examples

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
get_scope(fsk_obj)
get_session_info

**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
Import the file in file_path and transforms it into a list of class FSK2R.

Usage
import_fsk(file_path, check = FALSE)

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

Value
An instance of FSK2R.

Examples
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
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)
```

**Arguments**

- `object` Object to check

**Value**

A logical vector.

**Examples**

```r
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**

```r
is_fsk_with_r(fsk_obj)
```

**Arguments**

- `fsk_obj` An object of class FSK2R

**Value**

A logical vector.
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**
```r
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**
```r
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**
```r
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**
```r
n_simuls_fsk(fsk_obj)
```

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

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

**Examples**
```r
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 xlm file.
read_fsk_metadata_excel

*FSK metadata from local Excel file*

**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).

**Value**

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

---

read_fsk_model

*Read the model.sbml*

**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 with the information (model.sbml by default).
read_fsk_rdf_metadata

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

---

read_fsk_packages  Read the packages.json

Description
Read the packages.json

Usage
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 whith the information (metadata.rdf by default).

Value
A list with the contents of the .xml file.
\textbf{read_fsk_readme} \quad \textit{Read the README file}

\textbf{Description}
Read the README file

\textbf{Usage}
\begin{verbatim}
read_fsk_readme(file_dir, check = FALSE, filename = "README.txt")
\end{verbatim}

\textbf{Arguments}
- \texttt{file_dir} \quad path to the file.
- \texttt{check} \quad Whether to make checks. FALSE by default.
- \texttt{filename} \quad Name of the file with the information (README.txt by default).

\textbf{Value}
A character string with the content of the README file.

\textbf{read_fsk_sim} \quad \textit{Read the sim.sedml file}

\textbf{Description}
Read the sim.sedml file

\textbf{Usage}
\begin{verbatim}
read_fsk_sim(file_dir, check = FALSE, filename = "sim.sedml")
\end{verbatim}

\textbf{Arguments}
- \texttt{file_dir} \quad path to the file.
- \texttt{check} \quad Whether to make checks. FALSE by default.
- \texttt{filename} \quad Name of the file with the information (sim.sedml by default).

\textbf{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 cannot predict. This function 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**

```r
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**

```r
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 with 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
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

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

**Description**

Readme of an FSK object

**Usage**

```r
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**

```r
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

**Description**

Updates the manifest file

**Usage**

```r
update_manifest(fsk_object)
```

**Arguments**

- `fsk_object`: An instance of FSK2R.
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