

Package ‘umbridge’

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Title Integration for the UM-Bridge Protocol

Version 1.0

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Description A convenient wrapper for the UM-Bridge protocol. UM-Bridge is a protocol designed for coupling uncertainty quantification (or statistical / optimization) software to numerical models. A model is represented as a mathematical function with optional support for derivatives via Jacobian actions etc.

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Encoding UTF-8

RoxygenNote 7.2.1

BugReports <https://github.com/um-bridge>

Imports htr2, jsonlite, magrittr

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation no

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apply_hessian	<i>Evaluate Hessian of model.</i>
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Description

Evaluate Hessian of model.

Usage

```
apply_hessian(  
  url,  
  name,  
  out_wrt,  
  in_wrt1,  
  in_wrt2,  
  parameters,  
  sens,  
  vec,  
  config = jsonlite::fromJSON("{}")  
)
```

Arguments

url	URL the model is running at.
name	Name of the desired model.
out_wrt	Output variable to take Hessian with respect to.
in_wrt1	First input variable to take Hessian with respect to.
in_wrt2	Second input variable to take Hessian with respect to.
parameters	Model input parameter (a list of vectors).
sens	Sensitivity with respect to output.
vec	Vector to multiply Hessian by.
config	Model-specific configuration options.

Value

Hessian with respect to given inputs and outputs, applied to given sensitivity and vector.

apply_jacobian	<i>Evaluate Jacobian of model.</i>
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Description

Evaluate Jacobian of model.

Usage

```
apply_jacobian(  
  url,  
  name,  
  out_wrt,  
  in_wrt,  
  parameters,  
  vec,  
  config = jsonlite::fromJSON("{}")  
)
```

Arguments

url	URL the model is running at.
name	Name of the desired model.
out_wrt	Output variable to take Jacobian with respect to.
in_wrt	Input variable to take Jacobian with respect to.
parameters	Model input parameter (a list of vectors).
vec	Vector to multiply Jacobian by.
config	Model-specific configuration options.

Value

Jacobian with respect to given input and output variables, applied to given vector.

evaluate	<i>Evaluate model.</i>
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Description

Evaluate model.

Usage

```
evaluate(url, name, parameters, config = jsonlite::fromJSON("{}"))
```

Arguments

url	URL the model is running at.
name	Name of the desired model.
parameters	Model input parameter (a list of vectors).
config	Model-specific configuration options.

Value

The model output (a list of vectors).

get_models	<i>Get models supported by server.</i>
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Description

Get models supported by server.

Usage

```
get_models(url)
```

Arguments

url	URL the model is running at.
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Value

List of models supported by server.

gradient	<i>Evaluate gradient of target functional depending on model.</i>
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Description

Evaluate gradient of target functional depending on model.

Usage

```
gradient(
  url,
  name,
  out_wrt,
  in_wrt,
  parameters,
  sens,
  config = jsonlite::fromJSON("{}")
)
```

Arguments

url	URL the model is running at.
name	Name of the desired model.
out_wrt	Output variable to take gradient with respect to.
in_wrt	Input variable to take gradient with respect to.
parameters	Model input parameter (a list of vectors).
sens	Sensitivity of target functional with respect to model output.
config	Model-specific configuration options.

Value

Gradient of target functional.

model_input_sizes	<i>Retrieve model's input dimensions.</i>
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Description

Retrieve model's input dimensions.

Usage

```
model_input_sizes(url, name, config = jsonlite::fromJSON("{}"))
```

Arguments

url	URL the model is running at.
name	Name of the desired model.
config	Model-specific configuration options.

Value

List of input dimensions.

model_output_sizes	Retrieve model's output dimensions.
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Description

Retrieve model's output dimensions.

Usage

model_output_sizes(url, name, config = jsonlite::fromJSON("{}"))

Arguments

- url URL the model is running at.
- name Name of the desired model
- config Model-specific configuration options.

Value

List of output dimensions.

protocol_version_supported	Check if model's protocol version is supported by this client.
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Description

Check if model's protocol version is supported by this client.

Usage

protocol_version_supported(url)

Arguments

- url URL the model is running at.

Value

TRUE if model's protocol version is supported by this client, FALSE otherwise.

`supports_apply_hessian`*Check if model supports Hessian action.*

Description

Check if model supports Hessian action.

Usage

```
supports_apply_hessian(url, name)
```

Arguments

<code>url</code>	URL the model is running at.
<code>name</code>	Name of the desired model.

Value

TRUE if model supports Hessian action, FALSE otherwise.

`supports_apply_jacobian`*Check if model supports Jacobian action.*

Description

Check if model supports Jacobian action.

Usage

```
supports_apply_jacobian(url, name)
```

Arguments

<code>url</code>	URL the model is running at.
<code>name</code>	Name of the desired model.

Value

TRUE if model supports Jacobian action, FALSE otherwise.

supports_evaluate	<i>Check if model supports evaluation.</i>
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Description

Check if model supports evaluation.

Usage

```
supports_evaluate(url, name)
```

Arguments

url	URL the model is running at.
name	Name of the desired model.

Value

TRUE if model supports evaluation, FALSE otherwise.

supports_gradient	<i>Check if model supports gradient evaluation.</i>
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Description

Check if model supports gradient evaluation.

Usage

```
supports_gradient(url, name)
```

Arguments

url	URL the model is running at.
name	Name of the desired model.

Value

TRUE if model supports gradient evaluation, FALSE otherwise.

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