RelativeKinematicsComputationsModel

5.1

Generated by Doxygen 1.8.14

Contents

1 Module Index **1**

1.1 Modules 1

2 Namespace Index **3**

2.1 Namespace List 3

3 Data Structure Index **5**

3.1 Data Structures 5

4 File Index **7**

4.1 File List 7

5 Module Documentation **9**

5.1 Models 9

5.1.1 Detailed Description 9

5.2 Dynamics 10

5.2.1 Detailed Description 10

5.3 RelKin 11

5.3.1 Detailed Description 11

5.3.2 Macro Definition Documentation 11

5.3.2.1 PATH 11

6 Namespace Documentation **13**

6.1 jeod Namespace Reference 13

6.1.1 Detailed Description 13

7 Data Structure Documentation **15**

7.1 jeod::RelativeKinematics Class Reference . . . 15

7.1.1 Detailed Description . . . 16

7.1.2 Constructor & Destructor Documentation . . . 16

7.1.2.1 RelativeKinematics() [1/2] . . . 16

7.1.2.2 ∼RelativeKinematics() . . . 16

7.1.2.3 RelativeKinematics() [2/2] . . . 16

7.1.3 Member Function Documentation . . . 16

7.1.3.1 activate_relstate() . . . 16

7.1.3.2 add_relstate() . . . 17

7.1.3.3 find_relstate() . . . 17

7.1.3.4 operator=() . . . 18

7.1.3.5 remove_relstate() . . . 18

7.1.3.6 update_all() . . . 18

7.1.3.7 update_single() . . . 18

7.1.4 Friends And Related Function Documentation . . . 19

7.1.4.1 init_attrjeod__RelativeKinematics . . . 19

7.1.4.2 InputProcessor . . . 19

7.1.5 Field Documentation . . . 19

7.1.5.1 num_rel_states . . . 19

7.1.5.2 relative_states . . . 19

7.2 jeod::RelKinMessages Class Reference . . . 20

7.2.1 Detailed Description . . . 20

7.2.2 Constructor & Destructor Documentation . . . 20

7.2.2.1 RelKinMessages() [1/2] . . . 20

7.2.2.2 RelKinMessages() [2/2] . . . 20

7.2.3 Member Function Documentation . . . 21

7.2.3.1 operator=() . . . 21

7.2.4 Friends And Related Function Documentation . . . 21

7.2.4.1 init_attrjeod__RelKinMessages . . . 21

7.2.4.2 InputProcessor . . . 21

7.2.5 Field Documentation . . . 21

7.2.5.1 duplicate_entry . . . 21

7.2.5.2 entry_not_found . . . 22

7.2.5.3 invalid_entry . . . 22

8 File Documentation **23**

8.1 rel_kin_messages.cc File Reference 23

8.1.1 Detailed Description 23

8.2 rel_kin_messages.hh File Reference 23

8.2.1 Detailed Description 24

8.3 relative_kinematics.cc File Reference 24

8.3.1 Detailed Description 24

8.4 relative_kinematics.hh File Reference 24

8.4.1 Detailed Description 25

Index **27**

Chapter 1

Module Index

1.1 Modules

Here is a list of all modules:

Models 9
Dynamics 10
RelKin 11

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

jeod
Namespace jeod 13

Chapter 3

Data Structure Index

3.1 Data Structures

Here are the data structures with brief descriptions:

jeod::RelativeKinematics
Encapsulates functionality for computing relative states 15
jeod::RelKinMessages
Specifies the message IDs used in the orbital elements model 20

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

rel_kin_messages.cc
Implement the class RelKinMessages 23
rel_kin_messages.hh
Define the class RelKinMessages, the class that specifies the message IDs used in the relative kinematics model 23
relative_kinematics.cc
Define methods for the RelativeKinematics class 24
relative_kinematics.hh
Define the class RelativeKinematics, the class used for calculating the state of some point(s) of interest associated with the subject DynBody relative to some other reference frame 24

Chapter 5

Module Documentation

5.1 Models

Modules

- Dynamics

5.1.1 Detailed Description

5.2 Dynamics

Modules

- RelKin

5.2.1 Detailed Description

5.3 RelKin

Files

- file rel_kin_messages.hh

  Define the class RelKinMessages, the class that specifies the message IDs used in the relative kinematics model.
- file relative_kinematics.hh

  Define the class RelativeKinematics, the class used for calculating the state of some point(s) of interest associated with the subject DynBody relative to some other reference frame.
- file rel_kin_messages.cc

  Implement the class RelKinMessages.
- file relative_kinematics.cc

  Define methods for the RelativeKinematics class.

Namespaces

- jeod

  Namespace jeod.

Macros

- #define PATH "dynamics/rel_kin/"

5.3.1 Detailed Description

5.3.2 Macro Definition Documentation

5.3.2.1 PATH

```
#define PATH "dynamics/rel_kin/"
```

Definition at line 36 of file rel_kin_messages.cc.

Chapter 6

Namespace Documentation

6.1 jeod Namespace Reference

Namespace jeod.

Data Structures

- class RelativeKinematics

  Encapsulates functionality for computing relative states.
- class RelKinMessages

  Specifies the message IDs used in the orbital elements model.

6.1.1 Detailed Description

Namespace jeod.

Chapter 7

Data Structure Documentation

7.1 jeod::RelativeKinematics Class Reference

Encapsulates functionality for computing relative states.

`#include <relative_kinematics.hh>`

Public Member Functions

- RelativeKinematics ()

  Construct a RelativeKinematics object.
- ~RelativeKinematics ()

  Destruct a RelativeKinematics object.
- RelativeKinematics (const RelativeKinematics &)=delete
- RelativeKinematics & operator= (const RelativeKinematics &)=delete
- void add_relstate (RelativeDerivedState &relstate)

  Add a relative state to the list of ones maintained by this model.
- void remove_relstate (RelativeDerivedState &relstate)

  Remove a relative state from the list of ones maintained by this model.
- RelativeDerivedState * find_relstate (const std::string &relstate_name)

  Find a specific relative state maintained by this model.
- void activate_relstate (RelativeDerivedState &relstate, bool raf)

  Set flag for a relative state to be activated or deactivated by the RelKin manager.
- void update_single (const std::string &relstate_name)

  Update a single relative state maintained by this model.
- void update_all ()

  Update all relative states maintained by this model.

Data Fields

- unsigned int num_rel_states {}

  Length of above list of relative states being maintained by this.
- JeodPointerVector< RelativeDerivedState >::type relative_states

  List of relative states to be computed and maintained by this model.

Friends

- class InputProcessor
- void init_attrjeod__RelativeKinematics ()

7.1.1 Detailed Description

Encapsulates functionality for computing relative states.

Definition at line 85 of file relative_kinematics.hh.

7.1.2 Constructor & Destructor Documentation

7.1.2.1 RelativeKinematics() [1/2]

```
jeod::RelativeKinematics::RelativeKinematics ( )
```

Construct a RelativeKinematics object.

Definition at line 55 of file relative_kinematics.cc.

References relative_states.

7.1.2.2 ~RelativeKinematics()

```
jeod::RelativeKinematics::~RelativeKinematics ( )
```

Destruct a RelativeKinematics object.

Definition at line 65 of file relative_kinematics.cc.

References relative_states.

7.1.2.3 RelativeKinematics() [2/2]

```
jeod::RelativeKinematics::RelativeKinematics (
            const RelativeKinematics &  )  [delete]
```

7.1.3 Member Function Documentation

7.1.3.1 activate_relstate()

```
void jeod::RelativeKinematics::activate_relstate (
            RelativeDerivedState & relstate,
            bool raf )
```

Set flag for a relative state to be activated or deactivated by the RelKin manager.

Parameters

in	*relstate*	Relstate to activate/deactivate
in	*raf*	bool Relstate activation flag

Definition at line 151 of file relative_kinematics.cc.

References jeod::RelKinMessages::entry_not_found, find_relstate(), and jeod::RelKinMessages::invalid_entry.

7.1.3.2 add_relstate()

```
void jeod::RelativeKinematics::add_relstate (
             RelativeDerivedState & relstate )
```

Add a relative state to the list of ones maintained by this model.

Parameters

in	*relstate*	Relstate to add

Definition at line 74 of file relative_kinematics.cc.

References jeod::RelKinMessages::duplicate_entry, find_relstate(), num_rel_states, and relative_states.

7.1.3.3 find_relstate()

```
RelativeDerivedState * jeod::RelativeKinematics::find_relstate (
             const std::string & relstate_name )
```

Find a specific relative state maintained by this model.

Returns

Void

Parameters

in	*relstate_name*	Relstate to find

Definition at line 128 of file relative_kinematics.cc.

References num_rel_states, and relative_states.

Referenced by activate_relstate(), add_relstate(), and update_single().

7.1.3.4 operator=()

```
RelativeKinematics& jeod::RelativeKinematics::operator= (
            const RelativeKinematics &  )  [delete]
```

7.1.3.5 remove_relstate()

```
void jeod::RelativeKinematics::remove_relstate (
            RelativeDerivedState & relstate )
```

Remove a relative state from the list of ones maintained by this model.

Parameters

in	*relstate*	Relstate to remove

Definition at line 105 of file relative_kinematics.cc.

References jeod::RelKinMessages::entry_not_found, num_rel_states, and relative_states.

7.1.3.6 update_all()

```
void jeod::RelativeKinematics::update_all ( )
```

Update all relative states maintained by this model.

relstates that have been deactivated from RelKin will not be update.

Definition at line 198 of file relative_kinematics.cc.

References num_rel_states, and relative_states.

7.1.3.7 update_single()

```
void jeod::RelativeKinematics::update_single (
            const std::string & relstate_name )
```

Update a single relative state maintained by this model.

Parameters

in	*relstate_name*	Relstate to update

Definition at line 187 of file relative_kinematics.cc.

References find_relstate().

7.1.4 Friends And Related Function Documentation

7.1.4.1 init_attrjeod__RelativeKinematics

```
void init_attrjeod__RelativeKinematics ( )  [friend]
```

7.1.4.2 InputProcessor

```
friend class InputProcessor  [friend]
```

Definition at line 87 of file relative_kinematics.hh.

7.1.5 Field Documentation

7.1.5.1 num_rel_states

```
unsigned int jeod::RelativeKinematics::num_rel_states {}
```

Length of above list of relative states being maintained by this.

trick_units(–)

Definition at line 92 of file relative_kinematics.hh.

Referenced by add_relstate(), find_relstate(), remove_relstate(), and update_all().

7.1.5.2 relative_states

```
JeodPointerVector<RelativeDerivedState>::type jeod::RelativeKinematics::relative_states
```

List of relative states to be computed and maintained by this model.

Note that this list is not restricted to be relative states associated with only a single DynBody.trick_io(**)

Definition at line 99 of file relative_kinematics.hh.

Referenced by add_relstate(), find_relstate(), RelativeKinematics(), remove_relstate(), update_all(), and ~RelativeKinematics().

The documentation for this class was generated from the following files:

- relative_kinematics.hh
- relative_kinematics.cc

7.2 jeod::RelKinMessages Class Reference

Specifies the message IDs used in the orbital elements model.

`#include <rel_kin_messages.hh>`

Public Member Functions

- RelKinMessages ()=delete
- RelKinMessages (const RelKinMessages &)=delete
- RelKinMessages & operator= (const RelKinMessages &)=delete

Static Public Attributes

- static const char * duplicate_entry = "dynamics/rel_kin/" "duplicate_entry"
  Issued when a duplicate entry is found.
- static const char * entry_not_found = "dynamics/rel_kin/" "entry_not_found"
  Issued when an entry is not found.
- static const char * invalid_entry = "dynamics/rel_kin/" "invalid_entry"
  Issued when function input is invalid.

Friends

- class InputProcessor
- void init_attrjeod__RelKinMessages ()

7.2.1 Detailed Description

Specifies the message IDs used in the orbital elements model.

Definition at line 81 of file rel_kin_messages.hh.

7.2.2 Constructor & Destructor Documentation

7.2.2.1 RelKinMessages() [1/2]

```
jeod::RelKinMessages::RelKinMessages ( )  [delete]
```

7.2.2.2 RelKinMessages() [2/2]

```
jeod::RelKinMessages::RelKinMessages (
            const RelKinMessages &  )  [delete]
```

7.2.3 Member Function Documentation

7.2.3.1 operator=()

```
RelKinMessages& jeod::RelKinMessages::operator= (
            const RelKinMessages &  )  [delete]
```

7.2.4 Friends And Related Function Documentation

7.2.4.1 init_attrjeod__RelKinMessages

```
void init_attrjeod__RelKinMessages ( )  [friend]
```

7.2.4.2 InputProcessor

```
friend class InputProcessor  [friend]
```

Definition at line 83 of file rel_kin_messages.hh.

7.2.5 Field Documentation

7.2.5.1 duplicate_entry

```
const char * jeod::RelKinMessages::duplicate_entry = "dynamics/rel_kin/" "duplicate_entry"
[static]
```

Issued when a duplicate entry is found.

trick_units(–)

Definition at line 88 of file rel_kin_messages.hh.

Referenced by jeod::RelativeKinematics::add_relstate().

7.2.5.2 entry_not_found

```
const char * jeod::RelKinMessages::entry_not_found = "dynamics/rel_kin/" "entry_not_found"
[static]
```

Issued when an entry is not found.

trick_units(–)

Definition at line 93 of file rel_kin_messages.hh.

Referenced by jeod::RelativeKinematics::activate_relstate(), and jeod::RelativeKinematics::remove_relstate().

7.2.5.3 invalid_entry

```
const char * jeod::RelKinMessages::invalid_entry = "dynamics/rel_kin/" "invalid_entry"  [static]
```

Issued when function input is invalid.

trick_units(–)

Definition at line 98 of file rel_kin_messages.hh.

Referenced by jeod::RelativeKinematics::activate_relstate().

The documentation for this class was generated from the following files:

- rel_kin_messages.hh
- rel_kin_messages.cc

Chapter 8

File Documentation

8.1 rel_kin_messages.cc File Reference

Implement the class RelKinMessages.

```
#include "../include/rel_kin_messages.hh"
```

Namespaces

- jeod

  Namespace jeod.

Macros

- #define PATH "dynamics/rel_kin/"

8.1.1 Detailed Description

Implement the class RelKinMessages.

8.2 rel_kin_messages.hh File Reference

Define the class RelKinMessages, the class that specifies the message IDs used in the relative kinematics model.

```
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class jeod::RelKinMessages

  Specifies the message IDs used in the orbital elements model.

Namespaces

- jeod

  Namespace jeod.

8.2.1 Detailed Description

Define the class RelKinMessages, the class that specifies the message IDs used in the relative kinematics model.

8.3 relative_kinematics.cc File Reference

Define methods for the RelativeKinematics class.

```
#include <algorithm>
#include <cstddef>
#include "dynamics/derived_state/include/relative_derived_state.hh"
#include "utils/memory/include/jeod_alloc.hh"
#include "utils/message/include/message_handler.hh"
#include "utils/named_item/include/named_item.hh"
#include "../include/rel_kin_messages.hh"
#include "../include/relative_kinematics.hh"
```

Namespaces

- jeod

  Namespace jeod.

8.3.1 Detailed Description

Define methods for the RelativeKinematics class.

8.4 relative_kinematics.hh File Reference

Define the class RelativeKinematics, the class used for calculating the state of some point(s) of interest associated with the subject DynBody relative to some other reference frame.

```
#include "dynamics/derived_state/include/class_declarations.hh"
#include "utils/container/include/pointer_vector.hh"
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class jeod::RelativeKinematics

  Encapsulates functionality for computing relative states.

Namespaces

- jeod

  Namespace jeod.

8.4.1 Detailed Description

Define the class RelativeKinematics, the class used for calculating the state of some point(s) of interest associated with the subject DynBody relative to some other reference frame.

Index

~RelativeKinematics
    jeod::RelativeKinematics, 16

activate_relstate
    jeod::RelativeKinematics, 16
add_relstate
    jeod::RelativeKinematics, 17

duplicate_entry
    jeod::RelKinMessages, 21
Dynamics, 10

entry_not_found
    jeod::RelKinMessages, 21

find_relstate
    jeod::RelativeKinematics, 17

init_attrjeod__RelKinMessages
    jeod::RelKinMessages, 21
init_attrjeod__RelativeKinematics
    jeod::RelativeKinematics, 19
InputProcessor
    jeod::RelKinMessages, 21
    jeod::RelativeKinematics, 19
invalid_entry
    jeod::RelKinMessages, 22

jeod, 13
jeod::RelKinMessages, 20
    duplicate_entry, 21
    entry_not_found, 21
    init_attrjeod__RelKinMessages, 21
    InputProcessor, 21
    invalid_entry, 22
    operator=, 21
    RelKinMessages, 20
jeod::RelativeKinematics, 15
    ~RelativeKinematics, 16
    activate_relstate, 16
    add_relstate, 17
    find_relstate, 17
    init_attrjeod__RelativeKinematics, 19
    InputProcessor, 19
    num_rel_states, 19
    operator=, 17
    relative_states, 19
    RelativeKinematics, 16
    remove_relstate, 18
    update_all, 18
    update_single, 18

Models, 9

num_rel_states
    jeod::RelativeKinematics, 19

operator=
    jeod::RelKinMessages, 21
    jeod::RelativeKinematics, 17

PATH
    RelKin, 11

rel_kin_messages.cc, 23
rel_kin_messages.hh, 23
RelKin, 11
    PATH, 11
RelKinMessages
    jeod::RelKinMessages, 20
relative_kinematics.cc, 24
relative_kinematics.hh, 24
relative_states
    jeod::RelativeKinematics, 19
RelativeKinematics
    jeod::RelativeKinematics, 16
remove_relstate
    jeod::RelativeKinematics, 18

update_all
    jeod::RelativeKinematics, 18
update_single
    jeod::RelativeKinematics, 18