

## GravityGradientTorqueModel

5.1

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# Contents

<b>1</b>	<b>Module Index</b>	<b>1</b>
1.1	Modules . . . . .	1
<b>2</b>	<b>Namespace Index</b>	<b>3</b>
2.1	Namespace List . . . . .	3
<b>3</b>	<b>Data Structure Index</b>	<b>5</b>
3.1	Data Structures . . . . .	5
<b>4</b>	<b>File Index</b>	<b>7</b>
4.1	File List . . . . .	7
<b>5</b>	<b>Module Documentation</b>	<b>9</b>
5.1	Models . . . . .	9
5.1.1	Detailed Description . . . . .	9
5.2	Interactions . . . . .	10
5.2.1	Detailed Description . . . . .	10
5.3	GravityTorque . . . . .	11
5.3.1	Detailed Description . . . . .	11
5.3.2	Macro Definition Documentation . . . . .	11
5.3.2.1	PATH . . . . .	11
<b>6</b>	<b>Namespace Documentation</b>	<b>13</b>
6.1	jeod Namespace Reference . . . . .	13
6.1.1	Detailed Description . . . . .	13

<b>7</b>	<b>Data Structure Documentation</b>	<b>15</b>
7.1	jeod::GravityTorque Class Reference	15
7.1.1	Detailed Description	16
7.1.2	Constructor & Destructor Documentation	16
7.1.2.1	GravityTorque() [1/2]	16
7.1.2.2	~GravityTorque()	16
7.1.2.3	GravityTorque() [2/2]	16
7.1.3	Member Function Documentation	16
7.1.3.1	initialize()	16
7.1.3.2	operator=()	17
7.1.3.3	update()	17
7.1.4	Friends And Related Function Documentation	17
7.1.4.1	init_attrjeod__GravityTorque	17
7.1.4.2	InputProcessor	17
7.1.5	Field Documentation	17
7.1.5.1	active	17
7.1.5.2	subject_body	18
7.1.5.3	torque	18
7.2	jeod::GravityTorqueMessages Class Reference	18
7.2.1	Detailed Description	19
7.2.2	Constructor & Destructor Documentation	19
7.2.2.1	GravityTorqueMessages() [1/2]	19
7.2.2.2	GravityTorqueMessages() [2/2]	19
7.2.3	Member Function Documentation	19
7.2.3.1	operator=()	19
7.2.4	Friends And Related Function Documentation	19
7.2.4.1	init_attrjeod__GravityTorqueMessages	19
7.2.4.2	InputProcessor	20
7.2.5	Field Documentation	20
7.2.5.1	initialization_error	20
<b>8</b>	<b>File Documentation</b>	<b>21</b>
8.1	gravity_torque.cc File Reference	21
8.1.1	Detailed Description	21
8.2	gravity_torque.hh File Reference	21
8.2.1	Detailed Description	22
8.3	gravity_torque_messages.cc File Reference	22
8.3.1	Detailed Description	22
8.4	gravity_torque_messages.hh File Reference	22
8.4.1	Detailed Description	22

<b>Index</b>	<b>23</b>
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# Chapter 1

## Module Index

### 1.1 Modules

Here is a list of all modules:

Models . . . . .	9
Interactions . . . . .	10
GravityTorque . . . . .	11



## Chapter 2

# Namespace Index

### 2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

<a href="#">jeod</a>	Namespace jeod . . . . .	<a href="#">13</a>
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## Chapter 3

# Data Structure Index

### 3.1 Data Structures

Here are the data structures with brief descriptions:

<a href="#">jeod::GravityTorque</a>	
Computes the torque on an object due to gravitation . . . . .	15
<a href="#">jeod::GravityTorqueMessages</a>	
Specifies the message IDs used in the gravity torque model . . . . .	18



## Chapter 4

# File Index

### 4.1 File List

Here is a list of all files with brief descriptions:

<a href="#">gravity_torque.cc</a>	Gravity gradient torque model . . . . .	21
<a href="#">gravity_torque.hh</a>	Defines the class GravityTorque . . . . .	21
<a href="#">gravity_torque_messages.cc</a>	Implement the class GravityTorqueMessages . . . . .	22
<a href="#">gravity_torque_messages.hh</a>	Define the class GravityTorqueMessages, the class that specifies the message IDs used in the gravity torque model . . . . .	22



## Chapter 5

# Module Documentation

### 5.1 Models

#### Modules

- [Interactions](#)

#### 5.1.1 Detailed Description

## 5.2 Interactions

### Modules

- [GravityTorque](#)

### 5.2.1 Detailed Description

## 5.3 GravityTorque

### Files

- file [gravity\\_torque.hh](#)  
*Defines the class GravityTorque.*
- file [gravity\\_torque\\_messages.hh](#)  
*Define the class GravityTorqueMessages, the class that specifies the message IDs used in the gravity torque model.*
- file [gravity\\_torque.cc](#)  
*Gravity gradient torque model.*
- file [gravity\\_torque\\_messages.cc](#)  
*Implement the class GravityTorqueMessages.*

### Namespaces

- [jeod](#)  
*Namespace jeod.*

### Macros

- `#define` [PATH](#) "interactions/gravity\_torque/"

#### 5.3.1 Detailed Description

#### 5.3.2 Macro Definition Documentation

##### 5.3.2.1 PATH

```
#define PATH "interactions/gravity_torque/"
```

Definition at line 36 of file gravity\_torque\_messages.cc.





## Chapter 6

# Namespace Documentation

### 6.1 jeod Namespace Reference

Namespace jeod.

#### Data Structures

- class [GravityTorque](#)  
*Computes the torque on an object due to gravitation.*
- class [GravityTorqueMessages](#)  
*Specifies the message IDs used in the gravity torque model.*

#### 6.1.1 Detailed Description

Namespace jeod.



## Chapter 7

# Data Structure Documentation

### 7.1 jeod::GravityTorque Class Reference

Computes the torque on an object due to gravitation.

```
#include <gravity_torque.hh>
```

#### Public Member Functions

- [GravityTorque](#) ()=default
- [~GravityTorque](#) ()=default
- [GravityTorque](#) & [operator=](#) (const [GravityTorque](#) &)=delete
- [GravityTorque](#) (const [GravityTorque](#) &)=delete
- void [initialize](#) (DynBody &subject)  
*Initialize a [GravityTorque](#) object.*
- void [update](#) ()  
*Perform [GravityTorque](#) updates.*

#### Data Fields

- double [torque](#) [3] {}  
*The output torque, in the structural frame.*
- bool [active](#) {true}  
*Is the model active?*

#### Protected Attributes

- DynBody \* [subject\\_body](#) {}  
*The subject body for the gradient torque.*

#### Friends

- class [InputProcessor](#)
- void [init\\_attrjeod\\_\\_GravityTorque](#) ()

### 7.1.1 Detailed Description

Computes the torque on an object due to gravitation.

Definition at line 84 of file gravity\_torque.hh.

### 7.1.2 Constructor & Destructor Documentation

#### 7.1.2.1 GravityTorque() [1/2]

```
jeod::GravityTorque::GravityTorque ( ) [default]
```

#### 7.1.2.2 ~GravityTorque()

```
jeod::GravityTorque::~~GravityTorque ( ) [default]
```

#### 7.1.2.3 GravityTorque() [2/2]

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

### 7.1.3 Member Function Documentation

#### 7.1.3.1 initialize()

```
void jeod::GravityTorque::initialize (
    DynBody & subject )
```

Initialize a [GravityTorque](#) object.

##### Parameters

<i>in, out</i>	<i>subject</i>	DynBody object subject to the torque
----------------	----------------	--------------------------------------

Definition at line 54 of file gravity\_torque.cc.

References [subject\\_body](#).

### 7.1.3.2 operator=()

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

### 7.1.3.3 update()

```
void jeod::GravityTorque::update ( )
```

Perform [GravityTorque](#) updates.

Definition at line 62 of file gravity\_torque.cc.

References [active](#), [jeod::GravityTorqueMessages::initialization\\_error](#), [subject\\_body](#), and [torque](#).

## 7.1.4 Friends And Related Function Documentation

### 7.1.4.1 init\_attrjeod\_\_GravityTorque

```
void init_attrjeod__GravityTorque ( ) [friend]
```

### 7.1.4.2 InputProcessor

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

Definition at line 86 of file gravity\_torque.hh.

## 7.1.5 Field Documentation

### 7.1.5.1 active

```
bool jeod::GravityTorque::active {true}
```

Is the model active?

[trick\\_units\(-\)](#)

Definition at line 104 of file gravity\_torque.hh.

Referenced by [update\(\)](#).

### 7.1.5.2 subject\_body

```
DynBody* jeod::GravityTorque::subject_body {} [protected]
```

The subject body for the gradient torque.

trick\_units(—)

Definition at line 110 of file gravity\_torque.hh.

Referenced by initialize(), and update().

### 7.1.5.3 torque

```
double jeod::GravityTorque::torque[3] {}
```

The output torque, in the structural frame.

trick\_units(N\*m)

Definition at line 99 of file gravity\_torque.hh.

Referenced by update().

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

- [gravity\\_torque.hh](#)
- [gravity\\_torque.cc](#)

## 7.2 jeod::GravityTorqueMessages Class Reference

Specifies the message IDs used in the gravity torque model.

```
#include <gravity_torque_messages.hh>
```

### Public Member Functions

- [GravityTorqueMessages](#) ()=delete
- [GravityTorqueMessages](#) (const [GravityTorqueMessages](#) &)=delete
- [GravityTorqueMessages](#) & operator= (const [GravityTorqueMessages](#) &)=delete

### Static Public Attributes

- static const char \* [initialization\\_error](#) = "interactions/gravity\_torque/" "initialization\_error"  
*Issued when the model has not been properly initialized.*

## Friends

- class [InputProcessor](#)
- void [init\\_attrjeod\\_\\_GravityTorqueMessages](#) ()

### 7.2.1 Detailed Description

Specifies the message IDs used in the gravity torque model.

Definition at line 81 of file gravity\_torque\_messages.hh.

### 7.2.2 Constructor & Destructor Documentation

#### 7.2.2.1 GravityTorqueMessages() [1/2]

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

#### 7.2.2.2 GravityTorqueMessages() [2/2]

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

### 7.2.3 Member Function Documentation

#### 7.2.3.1 operator=()

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

### 7.2.4 Friends And Related Function Documentation

#### 7.2.4.1 init\_attrjeod\_\_GravityTorqueMessages

```
void init_attrjeod__GravityTorqueMessages ( ) [friend]
```

#### 7.2.4.2 InputProcessor

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

Definition at line 83 of file gravity\_torque\_messages.hh.

### 7.2.5 Field Documentation

#### 7.2.5.1 initialization\_error

```
const char * jeod::GravityTorqueMessages::initialization_error = "interactions/gravity_torque/" "initialization_error" [static]
```

Issued when the model has not been properly initialized.

trick\_units(-)

Definition at line 88 of file gravity\_torque\_messages.hh.

Referenced by jeod::GravityTorque::update().

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

- [gravity\\_torque\\_messages.hh](#)
- [gravity\\_torque\\_messages.cc](#)



## Chapter 8

# File Documentation

### 8.1 gravity\_torque.cc File Reference

Gravity gradient torque model.

```
#include <cstdlib>
#include "dynamics/dyn_body/include/dyn_body.hh"
#include "utils/math/include/matrix3x3.hh"
#include "utils/math/include/vector3.hh"
#include "utils/message/include/message_handler.hh"
#include "../include/gravity_torque.hh"
#include "../include/gravity_torque_messages.hh"
```

#### Namespaces

- [jeod](#)

*Namespace jeod.*

#### 8.1.1 Detailed Description

Gravity gradient torque model.

### 8.2 gravity\_torque.hh File Reference

Defines the class GravityTorque.

```
#include "dynamics/dyn_body/include/class_declarations.hh"
#include "utils/sim_interface/include/jeod_class.hh"
```

## Data Structures

- class [jeod::GravityTorque](#)  
*Computes the torque on an object due to gravitation.*

## Namespaces

- [jeod](#)  
*Namespace jeod.*

### 8.2.1 Detailed Description

Defines the class GravityTorque.

## 8.3 gravity\_torque\_messages.cc File Reference

Implement the class GravityTorqueMessages.

```
#include "../include/gravity_torque_messages.hh"
```

## Namespaces

- [jeod](#)  
*Namespace jeod.*

## Macros

- #define [PATH](#) "interactions/gravity\_torque/"

### 8.3.1 Detailed Description

Implement the class GravityTorqueMessages.

## 8.4 gravity\_torque\_messages.hh File Reference

Define the class GravityTorqueMessages, the class that specifies the message IDs used in the gravity torque model.

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

## Data Structures

- class [jeod::GravityTorqueMessages](#)  
*Specifies the message IDs used in the gravity torque model.*

## Namespaces

- [jeod](#)  
*Namespace jeod.*

### 8.4.1 Detailed Description

Define the class GravityTorqueMessages, the class that specifies the message IDs used in the gravity torque model.

# Index

~GravityTorque  
jeod::GravityTorque, 16

active  
jeod::GravityTorque, 17

gravity\_torque.cc, 21  
gravity\_torque.hh, 21  
gravity\_torque\_messages.cc, 22  
gravity\_torque\_messages.hh, 22  
GravityTorque, 11  
jeod::GravityTorque, 16  
PATH, 11  
GravityTorqueMessages  
jeod::GravityTorqueMessages, 19

init\_attrjeod\_\_GravityTorque  
jeod::GravityTorque, 17  
init\_attrjeod\_\_GravityTorqueMessages  
jeod::GravityTorqueMessages, 19  
initialization\_error  
jeod::GravityTorqueMessages, 20  
initialize  
jeod::GravityTorque, 16  
InputProcessor  
jeod::GravityTorque, 17  
jeod::GravityTorqueMessages, 19  
Interactions, 10

jeod, 13  
jeod::GravityTorque, 15  
jeod::GravityTorque, 16  
~GravityTorque, 16  
active, 17  
GravityTorque, 16  
init\_attrjeod\_\_GravityTorque, 17  
initialize, 16  
InputProcessor, 17  
operator=, 17  
subject\_body, 17  
torque, 18  
update, 17  
jeod::GravityTorqueMessages, 18  
GravityTorqueMessages, 19  
init\_attrjeod\_\_GravityTorqueMessages, 19  
initialization\_error, 20  
InputProcessor, 19  
operator=, 19

Models, 9

operator=

jeod::GravityTorque, 17  
jeod::GravityTorqueMessages, 19

PATH  
GravityTorque, 11

subject\_body  
jeod::GravityTorque, 17

torque  
jeod::GravityTorque, 18

update  
jeod::GravityTorque, 17