# ModFossaCpp

0.1

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# Contents

# Chapter 1

# Directory Hierarchy

## 1.1 Directories

This directory hierarchy is sorted roughly, but not completely, alphabetically:

# Chapter 2

# Class Index

## 2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

# Chapter 3

# File Index

## 3.1 File List

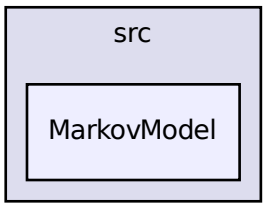
Here is a list of all files with brief descriptions:

# Chapter 4

# Directory Documentation

## 4.1 /home/gareth/git/modfossa/ModFossaCpp/src/MarkovModel/ Directory Reference

Directory dependency graph for /home/gareth/git/modfossa/ModFossaCpp/src/MarkovModel/:

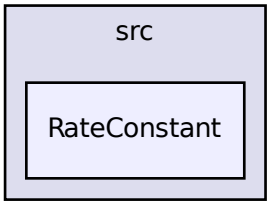



### Files

- file MarkovModel.cpp
- file MarkovModel.h

## 4.2 /home/gareth/git/modfossa/ModFossaCpp/src/RateConstant/ Directory Reference

Directory dependency graph for /home/gareth/git/modfossa/ModFossaCpp/src/RateConstant/:

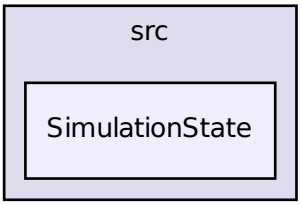



### Files

- file RateConstantBase.cpp
- file RateConstantBase.h
- file RateConstantType.h

## 4.3 /home/gareth/git/modfossa/ModFossaCpp/src/SimulationState/ Directory Reference

Directory dependency graph for /home/gareth/git/modfossa/ModFossaCpp/src/SimulationState/:

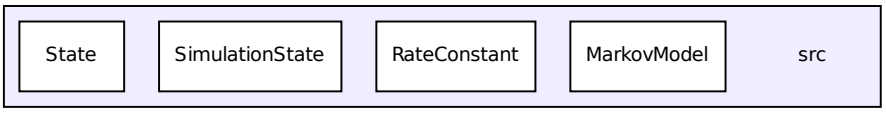


### Files

- file StateOfTheWorld.cpp
- file StateOfTheWorld.h

## 4.4 /home/gareth/git/modfossa/ModFossaCpp/src/ Directory Reference

Directory dependency graph for /home/gareth/git/modfossa/ModFossaCpp/src/:

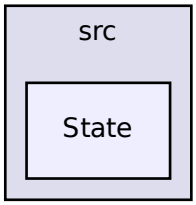



### Directories

- directory MarkovModel
- directory RateConstant
- directory SimulationState
- directory State

## 4.5 /home/gareth/git/modfossa/ModFossaCpp/src/State/ Directory Reference

Directory dependency graph for /home/gareth/git/modfossa/ModFossaCpp/src/State/:



## Files

- file State.cpp
- file State.h

# Chapter 5

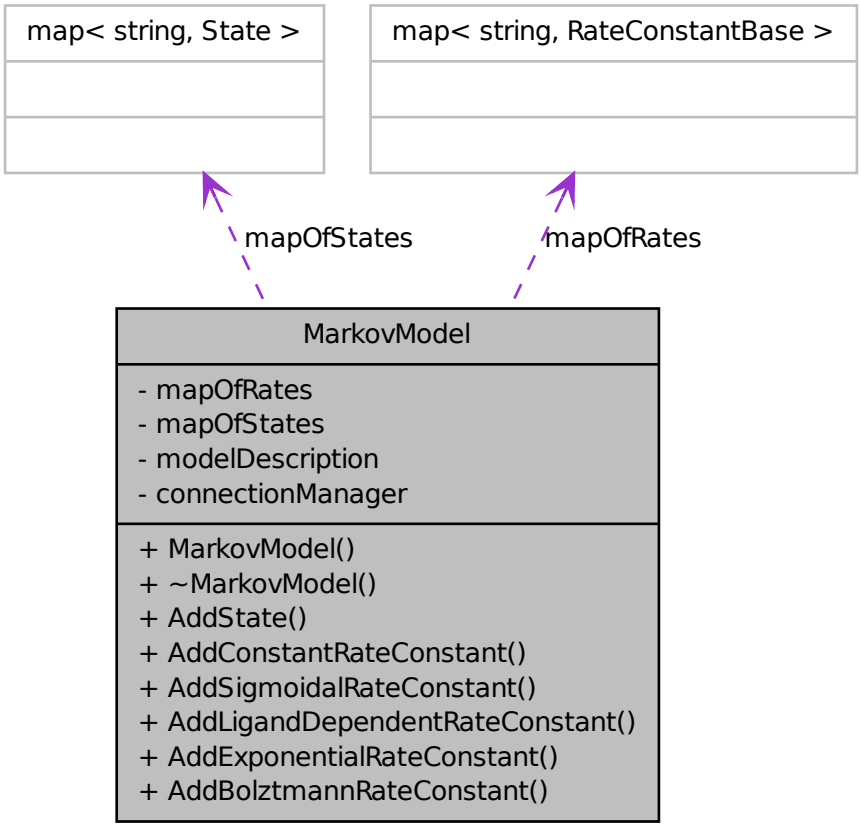
# Class Documentation

## 5.1 MarkovModel Class Reference

Class responsible for creating and storing information required to describe a MarkovModel for an ion channel.

`#include <MarkovModel.h>`

Collaboration diagram for MarkovModel:




## Public Member Functions

- MarkovModel ()
- ~MarkovModel ()
- void AddState (string name, bool conducting, bool initial=false)
- void AddConstantRateConstant (string name, double k)
- void AddSigmoidalRateConstant (string name, double a, double vHalf, double k)
- void AddLigandDependentRateConstant (string name, double k, double ligandPower, string ligandAbbreviation)
- void AddExponentialRateConstant (string name, double a, double k)
- void AddBolztmannRateConstant (string name, double a, double a2, double vHalf, double k)

## Private Attributes

- map< string, RateConstantBase > mapOfRates

- map< string, State > mapOfStates
- ModelDescription * modelDescription
- ConnectionManager * connectionManager

### 5.1.1 Detailed Description

Class responsible for creating and storing information required to describe a MarkovModel for an ion channel. The user adds RateConstants and States using the methods provided. After the model is described, the ConnectionManager and ModelDescription are used to create the transitionMatrix, which is used to run the simulation.

Definition at line 22 of file MarkovModel.h.

### 5.1.2 Constructor & Destructor Documentation

#### 5.1.2.1 MarkovModel::MarkovModel ( void )

Definition at line 4 of file MarkovModel.cpp.

#### 5.1.2.2 MarkovModel::~MarkovModel ( void )

Definition at line 9 of file MarkovModel.cpp.

### 5.1.3 Member Function Documentation

#### 5.1.3.1 void MarkovModel::AddBolztmannRateConstant ( string *name*, double *a*, double *a2*, double *vHalf*, double *k* )

#### 5.1.3.2 void MarkovModel::AddConstantRateConstant ( string *name*, double *k* )

#### 5.1.3.3 void MarkovModel::AddExponentialRateConstant ( string *name*, double *a*, double *k* )

#### 5.1.3.4 void MarkovModel::AddLigandDependentRateConstant ( string *name*, double *k*, double *ligandPower*, string *ligandAbbreviation* )

#### 5.1.3.5 void MarkovModel::AddSigmoidalRateConstant ( string *name*, double *a*, double *vHalf*, double *k* )

#### 5.1.3.6 void MarkovModel::AddState ( string *name*, bool *conducting*, bool *initial* = `false` )

### 5.1.4 Member Data Documentation

#### 5.1.4.1 ConnectionManager* MarkovModel::connectionManager [private]

Definition at line 47 of file MarkovModel.h.

#### 5.1.4.2 map<string, RateConstantBase> MarkovModel::mapOfRates [private]

Definition at line 43 of file MarkovModel.h.

#### 5.1.4.3 map<string, State> MarkovModel::mapOfStates [private]

Definition at line 44 of file MarkovModel.h.

#### 5.1.4.4 ModelDescription* MarkovModel::modelDescription [private]

Definition at line 46 of file MarkovModel.h.

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

- /home/gareth/git/modfossa/ModFossaCpp/src/MarkovModel/MarkovModel.h
- /home/gareth/git/modfossa/ModFossaCpp/src/MarkovModel/MarkovModel.cpp

## 5.2 RateConstantBase Class Reference

Abstract base class for RateConstants.

`#include <RateConstantBase.h>`

### Public Member Functions

- RateConstantBase ()
- virtual ~RateConstantBase ()
- virtual double GetRate (StateOfTheWorld *stateOfTheWorld)=0

### 5.2.1 Detailed Description

Abstract base class for RateConstants.

Definition at line 12 of file RateConstantBase.h.

### 5.2.2 Constructor & Destructor Documentation

#### 5.2.2.1 RateConstantBase::RateConstantBase ( void )

Definition at line 4 of file RateConstantBase.cpp.

#### 5.2.2.2 RateConstantBase::~RateConstantBase ( void ) [virtual]

Definition at line 9 of file RateConstantBase.cpp.

### 5.2.3 Member Function Documentation

#### 5.2.3.1 virtual double RateConstantBase::GetRate ( StateOfTheWorld * *stateOfTheWorld* ) [pure virtual]

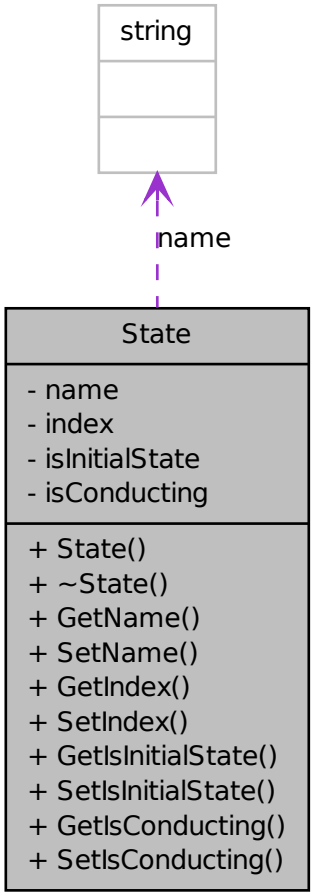
The documentation for this class was generated from the following files:

- /home/gareth/git/modfossa/ModFossaCpp/src/RateConstant/RateConstantBase.h
- /home/gareth/git/modfossa/ModFossaCpp/src/RateConstant/RateConstantBase.cpp

## 5.3 State Class Reference

`#include <State.h>`

Collaboration diagram for State:




### Public Member Functions

- State ()
- ~State ()
- std::string GetName () const
- void SetName (std::string name)

- int GetIndex () const
- void SetIndex (int index)
- bool GetIsInitialState () const
- void SetIsInitialState (bool isInitialState)
- bool GetIsConducting () const
- void SetIsConducting (bool isConducting)

## Private Attributes

- std::string name
- int index
- bool isInitialState
- bool isConducting

### 5.3.1 Detailed Description

Definition at line 6 of file State.h.

### 5.3.2 Constructor & Destructor Documentation

#### 5.3.2.1 State::State ( void )

Definition at line 4 of file State.cpp.

#### 5.3.2.2 State::~State ( void )

Definition at line 9 of file State.cpp.

### 5.3.3 Member Function Documentation

#### 5.3.3.1 int State::GetIndex ( ) const

#### 5.3.3.2 bool State::GetIsConducting ( ) const

#### 5.3.3.3 bool State::GetIsInitialState ( ) const

#### 5.3.3.4 std::string State::GetName ( ) const

#### 5.3.3.5 void State::SetIndex ( int *index* )

#### 5.3.3.6 void State::SetIsConducting ( bool *isConducting* )

#### 5.3.3.7 void State::SetIsInitialState ( bool *isInitialState* )

#### 5.3.3.8 void State::SetName ( std::string *name* )

### 5.3.4 Member Data Documentation

#### 5.3.4.1 int State::index [private]

Definition at line 26 of file State.h.

#### 5.3.4.2 bool State::isConducting [private]

Definition at line 28 of file State.h.

#### 5.3.4.3 bool State::isInitialState [private]

Definition at line 27 of file State.h.

#### 5.3.4.4 std::string State::name [private]

Definition at line 25 of file State.h.

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

- /home/gareth/git/modfossa/ModFossaCpp/src/State/State.h
- /home/gareth/git/modfossa/ModFossaCpp/src/State/State.cpp

## 5.4 StateOfTheWorld Class Reference

`#include <StateOfTheWorld.h>`

### Public Member Functions

- StateOfTheWorld ()
- ~StateOfTheWorld ()

### 5.4.1 Detailed Description

Definition at line 4 of file StateOfTheWorld.h.

### 5.4.2 Constructor & Destructor Documentation

#### 5.4.2.1 StateOfTheWorld::StateOfTheWorld ( void )

Definition at line 4 of file StateOfTheWorld.cpp.

#### 5.4.2.2 StateOfTheWorld::~StateOfTheWorld ( void )

Definition at line 9 of file StateOfTheWorld.cpp.

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

- /home/gareth/git/modfossa/ModFossaCpp/src/SimulationState/StateOfTheWorld.h
- /home/gareth/git/modfossa/ModFossaCpp/src/SimulationState/StateOfTheWorld.cpp

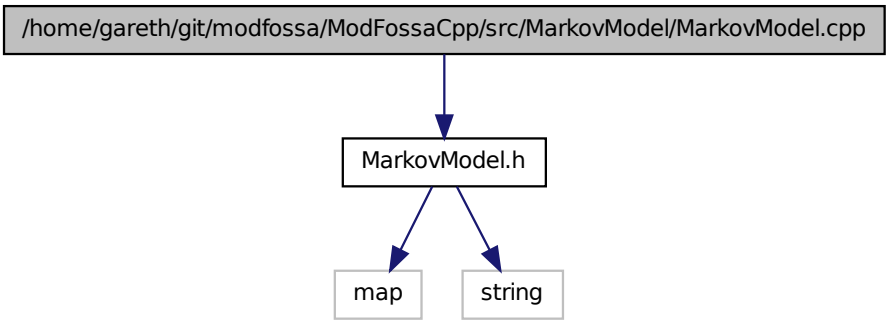
# Chapter 6

# File Documentation

## 6.1 /home/gareth/git/modfossa/ModFossaCpp/src/MarkovModel/MarkovModel.cp File Reference

```
#include "MarkovModel.h"
```

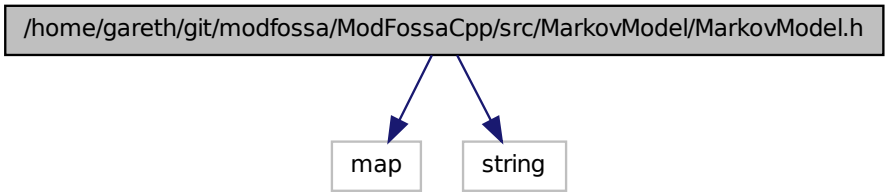
Include dependency graph for MarkovModel.cpp:



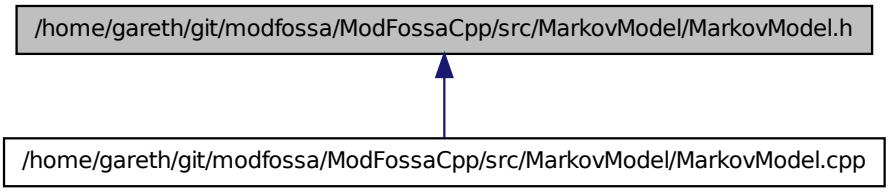

## 6.2 /home/gareth/git/modfossa/ModFossaCpp/src/MarkovModel/MarkovModel.h File Reference

```
#include <map>
#include <string>
```

Include dependency graph for MarkovModel.h:




This graph shows which files directly or indirectly include this file:




## Classes

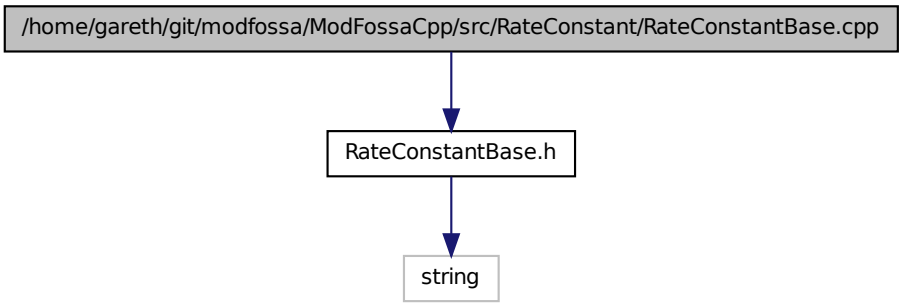
- class MarkovModel

  *Class responsible for creating and storing information required to describe a MarkovModel for an ion channel.*

# 6.3 /home/gareth/git/modfossa/ModFossaCpp/src/RateConstant/RateConstantBas File Reference

```
#include "RateConstantBase.h"
```

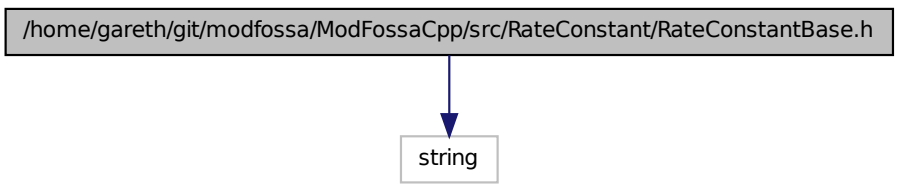
Include dependency graph for RateConstantBase.cpp:



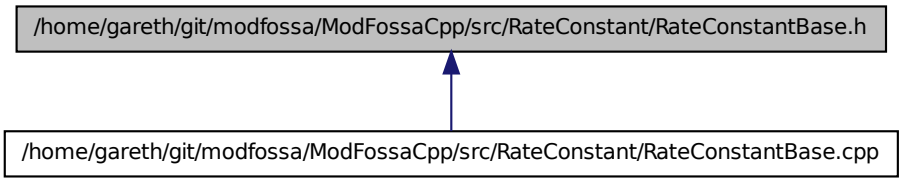

## 6.4 /home/gareth/git/modfossa/ModFossaCpp/src/RateConstant/RateConstantBas File Reference

```
#include <string>
```

Include dependency graph for RateConstantBase.h:



This graph shows which files directly or indirectly include this file:




## Classes

- class RateConstantBase
  *Abstract base class for RateConstants.*

# 6.5 /home/gareth/git/modfossa/ModFossaCpp/src/RateConstant/RateConstantTyp File Reference

## Enumerations

- enum RateConstantType {
  Constant, Sigmoidal, LigandDependent, Exponential,
  Bolztmann }

### 6.5.1 Enumeration Type Documentation

#### 6.5.1.1 enum RateConstantType

**Enumerator:**

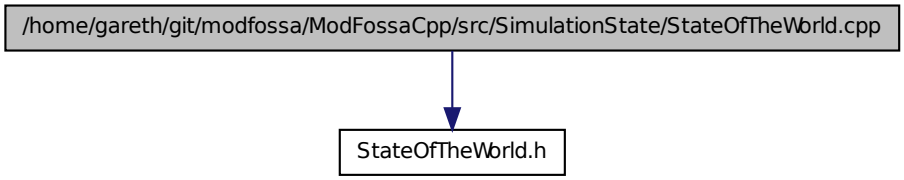
***Constant***
***Sigmoidal***
***LigandDependent***
***Exponential***
***Bolztmann***

Definition at line 4 of file RateConstantType.h.

# 6.6 /home/gareth/git/modfossa/ModFossaCpp/src/SimulationState/StateOfTheWo File Reference

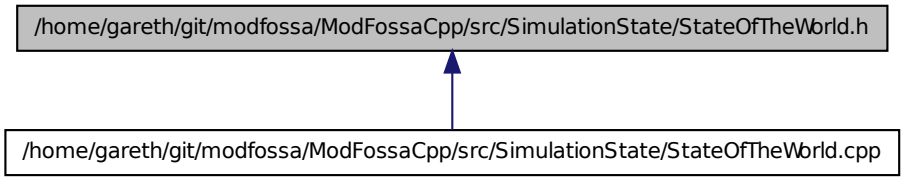
```
#include "StateOfTheWorld.h"
```

Include dependency graph for StateOfTheWorld.cpp:




## 6.7 /home/gareth/git/modfossa/ModFossaCpp/src/SimulationState/StateOfTheWo File Reference

This graph shows which files directly or indirectly include this file:



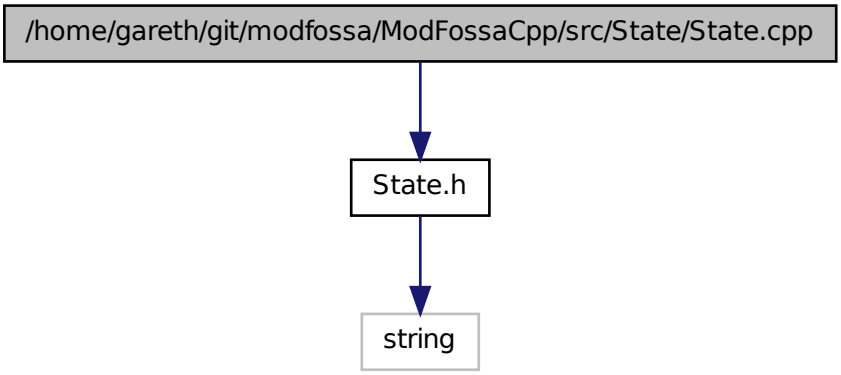

### Classes

- class StateOfTheWorld

## 6.8 /home/gareth/git/modfossa/ModFossaCpp/src/State/State.cpp File Reference

```
#include "State.h"
```

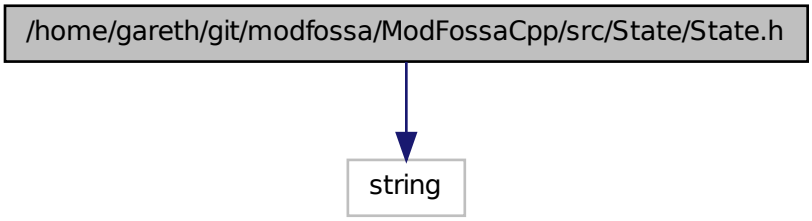
Include dependency graph for State.cpp:



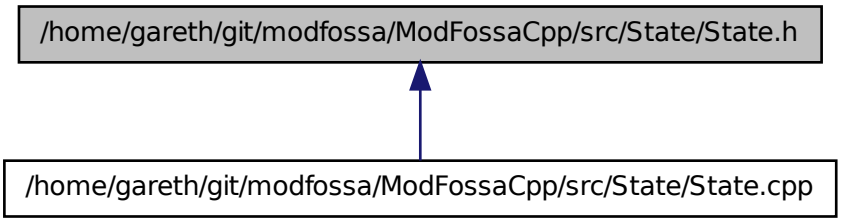

## 6.9 /home/gareth/git/modfossa/ModFossaCpp/src/State/State.h File Reference

```
#include <string>
```

Include dependency graph for State.h:



This graph shows which files directly or indirectly include this file:




## Classes

- class State