
rmf_simulation

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CONTENTS:

1	rmf_simulation API	3
1.1	Class Hierarchy	3
1.2	File Hierarchy	3
1.3	Full API	3
	Index	33

Simulation plugins for use with OpenRMF.

RMF_SIMULATION API

1.1 Class Hierarchy

1.2 File Hierarchy

1.3 Full API

1.3.1 Namespaces

Namespace `crowd_simulator`

Contents

- *Classes*
- *Typedefs*

Classes

- *Struct* `CrowdSimInterface::Object`
- *Struct* `ModelTypeDatabase::Record`
- *Class* `AgentPose3d`
- *Class* `CrowdSimInterface`
- *Class* `MengeHandle`
- *Class* `ModelTypeDatabase`

Typedefs

- *Typedef crowd_simulator::AgentPtr*

Namespace rmf_building_sim_common

Contents

- *Classes*
- *Functions*
- *Typedefs*

Classes

- *Struct DoorCommon::DoorElement*
- *Struct DoorCommon::DoorUpdateRequest*
- *Struct DoorCommon::DoorUpdateResult*
- *Struct LiftCommon::LiftUpdateResult*
- *Struct MotionParams*
- *Class DoorCommon*
- *Class LiftCommon*

Functions

- *Function rmf_building_sim_common::compute_desired_rate_of_change*
- *Function rmf_building_sim_common::compute_ds*
- *Template Function rmf_building_sim_common::get_element_required*
- *Template Function rmf_building_sim_common::get_sdf_attribute_required*
- *Template Function rmf_building_sim_common::get_sdf_param_if_available*
- *Template Function rmf_building_sim_common::get_sdf_param_required*

Typedefs

- *Typedef rmf_building_sim_common::DoorMode*
- *Typedef rmf_building_sim_common::DoorRequest*
- *Typedef rmf_building_sim_common::DoorState*
- *Typedef rmf_building_sim_common::LiftRequest*
- *Typedef rmf_building_sim_common::LiftState*

Namespace rmf_dispenser_common

Contents

- *Classes*

Classes

- *Class TeleportDispenserCommon*

Namespace rmf_ingestor_common

Contents

- *Classes*

Classes

- *Class TeleportIngestorCommon*

Namespace rmf_plugins_utils

Contents

- *Classes*
- *Enums*
- *Functions*

Classes

- *Struct MotionParams*
- *Struct SimEntity*

Enums

- *Enum Simulator*

Functions

- *Function rmf_plugins_utils::compute_desired_rate_of_change*
- *Function rmf_plugins_utils::compute_ds*
- *Template Function rmf_plugins_utils::convert(const Eigen::Quaterniond&, IgnQuatT&)*
- *Template Function rmf_plugins_utils::convert(const Eigen::Vector3d&, IgnVec3T&)*
- *Template Function rmf_plugins_utils::convert_pose*
- *Template Function rmf_plugins_utils::convert_quat*
- *Template Function rmf_plugins_utils::convert_to_pose*
- *Template Function rmf_plugins_utils::convert_vec*
- *Template Function rmf_plugins_utils::get_element_required*
- *Template Function rmf_plugins_utils::get_sdf_attribute_required*
- *Template Function rmf_plugins_utils::get_sdf_param_if_available*
- *Template Function rmf_plugins_utils::get_sdf_param_required*
- *Template Function rmf_plugins_utils::make_response*
- *Function rmf_plugins_utils::simulation_now*

Namespace rmf_readonly_common

Contents

- *Classes*

Classes

- *Class ReadonlyCommon*

Namespace rmf_robot_sim_common

Contents

- *Classes*
- *Enums*
- *Functions*

Classes

- *Struct AckermannTrajectory*
- *Struct SlotcarCommon::ChargerWaypoint*
- *Struct SlotcarCommon::PowerParams*
- *Struct SlotcarCommon::UpdateResult*
- *Struct TrajectoryPoint*
- *Class SlotcarCommon*

Enums

- *Enum SteeringType*

Functions

- *Template Function rmf_robot_sim_common::get_element_val_if_present*

1.3.2 Classes and Structs

Struct CrowdSimInterface::Object

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_crowd_simulator_common.hpp

Nested Relationships

This struct is a nested type of *Class CrowdSimInterface*.

Struct Documentation

```
struct crowd_simulator::CrowdSimInterface::Object
```

Public Functions

AnimState **get_next_state** (bool *condition*)

Public Members

AgentPtr **agent_ptr**

std::string **model_name**

std::string **type_name**

bool **is_external** = false

AnimState **current_state**

Struct `ModelTypeDatabase::Record`

- Defined in file `latest_rmf_building_sim_common_include_rmf_building_sim_common_crowd_simulator_common.hpp`

Nested Relationships

This struct is a nested type of *Class `ModelTypeDatabase`*.

Struct Documentation

```
struct crowd_simulator::ModelTypeDatabase::Record
```

Public Members

```
std::string type_name
std::string file_name
AgentPose3d pose
std::string animation
std::string idle_animation
double animation_speed
```

Struct `DoorCommon::DoorElement`

- Defined in file `latest_rmf_building_sim_common_include_rmf_building_sim_common_door_common.hpp`

Nested Relationships

This struct is a nested type of *Class `DoorCommon`*.

Struct Documentation

```
struct rmf_building_sim_common::DoorCommon::DoorElement
```

Public Functions

```
inline DoorElement ()
inline DoorElement (const double lower_limit, const double upper_limit, const bool
                    flip_direction = false)
```

Public Members

double **closed_position**
double **open_position**
double **current_position**
double **current_velocity**

Struct DoorCommon::DoorUpdateRequest

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_door_common.hpp

Nested Relationships

This struct is a nested type of *Class DoorCommon*.

Struct Documentation

```
struct rmf_building_sim_common::DoorCommon::DoorUpdateRequest
```

Public Members

std::string **joint_name**
double **position**
double **velocity**

Struct DoorCommon::DoorUpdateResult

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_door_common.hpp

Nested Relationships

This struct is a nested type of *Class DoorCommon*.

Struct Documentation

```
struct rmf_building_sim_common::DoorCommon::DoorUpdateResult
```

Public Members

std::string **joint_name**
double **velocity**
double **fmax**

Struct LiftCommon::LiftUpdateResult

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_lift_common.hpp

Nested Relationships

This struct is a nested type of *Class LiftCommon*.

Struct Documentation

```
struct rmf_building_sim_common::LiftCommon::LiftUpdateResult
```

Public Members

double **velocity**
double **fmax**

Struct MotionParams

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_utils.hpp

Struct Documentation

```
struct rmf_building_sim_common::MotionParams
```

Public Members

double **v_max** = 0.2
double **a_max** = 0.1
double **a_nom** = 0.08
double **dx_min** = 0.01
double **f_max** = 10000000.0

Struct MotionParams

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Struct Documentation

```
struct rmf_plugins_utils::MotionParams
```

Public Members

```
double v_max = 0.2  
double a_max = 0.1  
double a_nom = 0.08  
double dx_min = 0.01  
double f_max = 10000000.0
```

Struct SimEntity

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Struct Documentation

```
struct rmf_plugins_utils::SimEntity
```

Public Functions

```
inline SimEntity (uint64_t en)  
inline SimEntity (std::string nm)  
inline const std::string &get_name () const  
inline uint64_t get_entity () const
```

Public Members

```
Simulator sim_type  
uint64_t entity  
std::string name
```

Struct AckermannTrajectory

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Struct Documentation

```
struct rmf_robot_sim_common::AckermannTrajectory
```

Public Functions

```
inline AckermannTrajectory(const Eigen::Vector2d &_x0, const Eigen::Vector2d &_x1,  
                           const Eigen::Vector2d &_v1 = Eigen::Vector2d(0, 0), bool  
                           _turning = false)
```

Public Members

```
Eigen::Vector2d x0  
Eigen::Vector2d x1  
Eigen::Vector2d v0  
Eigen::Vector2d v1  
bool turning = false
```

Struct SlotcarCommon::ChargerWaypoint

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Nested Relationships

This struct is a nested type of *Class SlotcarCommon*.

Struct Documentation

```
struct rmf_robot_sim_common::SlotcarCommon::ChargerWaypoint
```

Public Functions

```
inline ChargerWaypoint (double x, double y)
```


Public Members

double **x**

double **y**

Struct SlotcarCommon::PowerParams

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Nested Relationships

This struct is a nested type of *Class SlotcarCommon*.

Struct Documentation

```
struct rmf_robot_sim_common::SlotcarCommon::PowerParams
```

Public Members

double **nominal_voltage** = 12

double **nominal_capacity** = 24

double **charging_current** = 2

double **mass** = 20

double **inertia** = 10

double **friction_coefficient** = 0.3

double **nominal_power** = 10

Struct SlotcarCommon::UpdateResult

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Nested Relationships

This struct is a nested type of *Class SlotcarCommon*.

Struct Documentation

```
struct rmf_robot_sim_common::SlotcarCommon::UpdateResult
```

Public Members

double **v** = 0.0

double **w** = 0.0

double **speed** = 0.0

Struct TrajectoryPoint

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Struct Documentation

```
struct rmf_robot_sim_common::TrajectoryPoint
```

Public Functions

```
inline TrajectoryPoint (const Eigen::Vector3d &_pos, const Eigen::Quaterniond &_quat)
```

Public Members

Eigen::Vector3d **pos**

Eigen::Quaterniond **quat**

Class AgentPose3d

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_crowd_simulator_common.hpp

Class Documentation

```
class crowd_simulator::AgentPose3d
```

Public Functions

```
inline AgentPose3d ()
```

```
inline AgentPose3d (double x, double y, double z, double roll, double pitch, double yaw)
```

```
inline double x () const
```

```
inline double y () const
```

```
inline double z () const
```

```
inline double roll () const
```

```
inline double pitch () const
```

```
inline double yaw () const
```

```
inline void x (double x)
```

```

inline void y (double y)
inline void z (double z)
inline void roll (double roll)
inline void pitch (double pitch)
inline void yaw (double yaw)
template<typename IgnMathPose3d>
inline IgnMathPose3d convert_to_ign_math_pose_3d()

```

Class CrowdSimInterface

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_crowd_simulator_common.hpp

Nested Relationships

Nested Types

- *Struct CrowdSimInterface::Object*

Class Documentation

```
class crowd_simulator::CrowdSimInterface
```

Public Types

```
enum AnimState
```

Values:

```
    enumerator WALK
```

```
    enumerator IDLE
```

```
using ObjectPtr = std::shared_ptr<Object>
```

Public Functions

```
inline CrowdSimInterface()
```

```
rclepp::Logger logger() const
```

```
void init_ros_node(const rclepp::Node::SharedPtr node)
```

```
bool init_crowd_sim()
```

```
double get_sim_time_step() const
```

```
size_t get_num_objects() const
```

```
ObjectPtr get_object_by_id(size_t id) const
```

```
void one_step_sim(double time_step) const
```

```
double get_switch_anim_distance_th() const
```

```
std::vector<std::string> get_switch_anim_name () const  
  
bool enabled () const  
  
template<typename SdfPtrT>  
bool read_sdf (SdfPtrT &sdf)  
  
template<typename IgnMathPose3d>  
void update_external_agent (size_t id, const IgnMathPose3d &model_pose)  
  
template<typename IgnMathPose3d>  
void update_external_agent (const AgentPtr agent_ptr, const IgnMathPose3d  
                           &model_pose)  
  
template<typename IgnMathPose3d>  
IgnMathPose3d get_agent_pose (size_t id, double delta_sim_time)  
  
template<typename IgnMathPose3d>  
IgnMathPose3d get_agent_pose (const AgentPtr agent_ptr, double delta_sim_time)
```

Public Members

```
std::shared_ptr<ModelTypeDatabase> _model_type_db_ptr  
  
struct Object
```

Public Functions

```
AnimState get_next_state (bool condition)
```

Public Members

```
AgentPtr agent_ptr  
std::string model_name  
std::string type_name  
bool is_external = false  
AnimState current_state
```

Class MengeHandle

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_crowd_simulator_common.hpp

Inheritance Relationships

Base Type

- public std::enable_shared_from_this< MengeHandle >

Class Documentation

```
class crowd_simulator::MengeHandle : public std::enable_shared_from_this<MengeHandle>
```

Public Functions

```
inline MengeHandle (const std::string &resource_path, const std::string &behavior_file, const
                    std::string &scene_file, const float sim_time_step = 0.0)
void set_sim_time_step (float sim_time_step)
float get_sim_time_step () const
size_t get_agent_count ()
void sim_step () const
AgentPtr get_agent (size_t id) const
```

Public Static Functions

```
static std::shared_ptr<MengeHandle> init_and_make (const std::string &resource_path,
                                                  const std::string &behavior_file, const
                                                  std::string &scene_file, const float
                                                  sim_time_step)
```

Class ModelTypeDatabase

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_crowd_simulator_common.hpp

Nested Relationships

Nested Types

- Struct ModelTypeDatabase::Record

Class Documentation

```
class crowd_simulator::ModelTypeDatabase
```

Public Types

```
using RecordPtr = std::shared_ptr<Record>
```

Public Functions

RecordPtr **emplace** (std::string *type_name*, *RecordPtr* *record_ptr*)

size_t **size** () **const**

RecordPtr **get** (**const** std::string &*type_name*) **const**

struct **Record**

Public Members

std::string **type_name**

std::string **file_name**

AgentPose3d **pose**

std::string **animation**

std::string **idle_animation**

double **animation_speed**

Class DoorCommon

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_door_common.hpp

Nested Relationships

Nested Types

- *Struct DoorCommon::DoorElement*
- *Struct DoorCommon::DoorUpdateRequest*
- *Struct DoorCommon::DoorUpdateResult*

Class Documentation

class rmf_building_sim_common::DoorCommon

Public Functions

rclogpp::Logger **logger** () **const**

std::vector<std::string> **joint_names** () **const**

MotionParams &**params** ()

std::vector<*DoorUpdateResult*> **update** (**const** double *time*, **const**
std::vector<*DoorUpdateRequest*> &*request*)

Public Static Functions

```
template<typename SdfPtrT>
static std::shared_ptr<DoorCommon> make (const std::string &door_name,
rclepp::Node::SharedPtr node, SdfPtrT &sdf)

struct DoorUpdateRequest
```

Public Members

```
std::string joint_name
double position
double velocity
struct DoorUpdateResult
```

Public Members

```
std::string joint_name
double velocity
double fmax
```

Class LiftCommon

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_lift_common.hpp

Nested Relationships

Nested Types

- Struct *LiftCommon::LiftUpdateResult*

Class Documentation

```
class rmf_building_sim_common::LiftCommon
```

Public Functions

```
rclepp::Logger logger () const
LiftUpdateResult update (const double time, const double position, const double velocity)
std::string get_joint_name () const
double get_elevation () const
bool motion_state_changed ()
```

Public Static Functions

```
template<typename SdfPtrT>
static std::unique_ptr<LiftCommon> make (const std::string &lift_name, rclcpp::Node::SharedPtr
                                         node, SdfPtrT &sdf)

struct LiftUpdateResult
```

Public Members

```
double velocity
double fmax
```

Class TeleportDispenserCommon

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_dispenser_common.hpp

Class Documentation

```
class rmf_dispenser_common::TeleportDispenserCommon
```

Public Types

```
using FleetState = rmf_fleet_msgs::msg::FleetState
using FleetStateIt = std::unordered_map<std::string, FleetState::UniquePtr>::iterator
using DispenserState = rmf_dispenser_msgs::msg::DispenserState
using DispenserRequest = rmf_dispenser_msgs::msg::DispenserRequest
using DispenserResult = rmf_dispenser_msgs::msg::DispenserResult
```

Public Functions

```
void send_dispenser_response (uint8_t status) const
void fleet_state_cb (FleetState::UniquePtr msg)
void dispenser_request_cb (DispenserRequest::UniquePtr msg)
void on_update (std::function<void> FleetStateIt, std::vector<rmf_plugins_utils::SimEntity>&
                > fill_robot_list_cb, std::function<rmf_plugins_utils::SimEntity const
std::vector<rmf_plugins_utils::SimEntity>&, bool>& find_nearest_model_cb, std::function<void const
rmf_plugins_utils::SimEntity>& place_on_entity_cb, std::function<bool void> check_filled_cb
void init_ros_node (const rclcpp::Node::SharedPtr node)
```


Public Members

```
bool dispense = false
DispenserRequest latest
std::string guid
double last_pub_time = 0.0
double sim_time = 0.0
bool item_en_found = false
bool dispenser_filled = false
rclcpp::Node::SharedPtr ros_node
std::unordered_map<std::string, FleetState::UniquePtr> fleet_states
DispenserState current_state
```

Class TeleportIngestorCommon

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_ingestor_common.hpp

Class Documentation

```
class rmf_ingestor_common::TeleportIngestorCommon
```

Public Types

```
using FleetState = rmf_fleet_msgs::msg::FleetState
using FleetStateIt = std::unordered_map<std::string, FleetState::UniquePtr>::iterator
using IngestorState = rmf_ingestor_msgs::msg::IngestorState
using IngestorRequest = rmf_ingestor_msgs::msg::IngestorRequest
using IngestorResult = rmf_ingestor_msgs::msg::IngestorResult
```

Public Functions

```
void send_ingestor_response (uint8_t status) const
void fleet_state_cb (FleetState::UniquePtr msg)
void ingestor_request_cb (IngestorRequest::UniquePtr msg)
void on_update (std::function<void> FleetStateIt, std::vector<rmf_plugins_utils::SimEntity>&
    > fill_robot_list_cb, std::function<rmf_plugins_utils::SimEntity const
    std::vector<rmf_plugins_utils::SimEntity>&, bool&> find_nearest_model_cb, std::function<bool const
    SimEntity&> get_payload_model_cb, std::function<void> transport_model_cbstd::function<void void>
    send_ingested_item_home_cb)
void init_ros_node (const rclcpp::Node::SharedPtr node)
```

Public Members

```
bool ingest = false
IngestorRequest latest
std::string _guid
bool ingestor_filled = false
double last_pub_time = 0.0
double last_ingested_time = 0.0
double sim_time = 0.0
rclepp::Node::SharedPtr ros_node
std::unordered_map<std::string, Eigen::Isometry3d> non_static_models_init_poses
std::unordered_map<std::string, FleetState::UniquePtr> fleet_states
IngestorState current_state
```

Class ReadonlyCommon

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_readonly_common.hpp

Class Documentation

```
class rmf_readonly_common::ReadonlyCommon
```

Public Types

```
using BuildingMap = rmf_building_map_msgs::msg::BuildingMap
using Level = rmf_building_map_msgs::msg::Level
using Graph = rmf_building_map_msgs::msg::Graph
using Location = rmf_fleet_msgs::msg::Location
using Path = std::vector<Location>
```

Public Functions

```
void set_name (const std::string &name)
std::string get_name () const
rclepp::Logger logger ()
template<typename SdfPtrT>
void read_sdf (SdfPtrT &sdf)
void init (rclepp::Node::SharedPtr node)
void on_update (Eigen::Isometry3d &pose, double sim_time)
```

Public Members

rclepp::Node::SharedPtr **ros_node**

Class SlotcarCommon

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Nested Relationships

Nested Types

- *Struct SlotcarCommon::ChargerWaypoint*
- *Struct SlotcarCommon::PowerParams*
- *Struct SlotcarCommon::UpdateResult*

Class Documentation

class rmf_robot_sim_common::SlotcarCommon

Public Functions

```
SlotcarCommon()

rclepp::Logger logger() const

template<typename SdfPtrT>
void read_sdf(SdfPtrT &sdf)

void set_model_name(const std::string &model_name)

std::string model_name() const

void init_ros_node(const rclepp::Node::SharedPtr node)

UpdateResult update(const Eigen::Isometry3d &pose, const std::vector<Eigen::Vector3d> &ob-
    stacle_positions, const double time)

bool emergency_stop(const std::vector<Eigen::Vector3d> &obstacle_positions, const
    Eigen::Vector3d &current_heading)

std::array<double, 2> calculate_control_signals(const std::array<double, 2>
    &curr_velocities, const std::pair<double,
    double> &displacements, const double
    dt, const double target_linear_velocity =
    0.0) const

std::array<double, 2> calculate_joint_control_signals(const std::array<double, 2>
    &w_tire, const std::pair<double,
    double> &displacements, const
    double dt) const

void charge_state_cb(const std::string &name, bool selected)

void publish_robot_state(const double time)
```

```
struct UpdateResult
```

Public Members

```
double v = 0.0
```

```
double w = 0.0
```

```
double speed = 0.0
```

1.3.3 Enums

Enum Simulator

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Enum Documentation

```
enum rmf_plugins_utils::Simulator
```

Values:

```
enumerator Ignition
```

```
enumerator Gazebo
```

Enum SteeringType

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Enum Documentation

```
enum rmf_robot_sim_common::SteeringType
```

Values:

```
enumerator DIFF_DRIVE
```

```
enumerator ACKERMANN
```

1.3.4 Functions

Function rmf_building_sim_common::compute_desired_rate_of_change

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_utils.hpp

Function Documentation

```
double rmf_building_sim_common::compute_desired_rate_of_change(double _s_target,
                                                                double _v_actual,
                                                                const MotionParams &_motion_params,
                                                                const double _dt)
```

Function rmf_building_sim_common::compute_ds

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_utils.hpp

Function Documentation

```
double rmf_building_sim_common::compute_ds(double s_target, double v_actual, const double v_max,
const double accel_nom, const double accel_max, const double dt)
```

Template Function rmf_building_sim_common::get_element_required

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_utils.hpp

Function Documentation

```
template<typename SdfPtrT, typename SdfElementPtrT>
bool rmf_building_sim_common::get_element_required(SdfPtrT &sdf, const std::string
&_element_name, SdfElementPtrT
&_element)
```

Template Function rmf_building_sim_common::get_sdf_attribute_required

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_utils.hpp

Function Documentation

```
template<typename T, typename SdfPtrT>
bool rmf_building_sim_common::get_sdf_attribute_required(SdfPtrT &sdf, const
std::string &attribute_name, T &value)
```

Template Function `rmf_building_sim_common::get_sdf_param_if_available`

- Defined in `file_latest_rmf_building_sim_common_include_rmf_building_sim_common_utils.hpp`

Function Documentation

```
template<typename T, typename SdfPtrT>
void rmf_building_sim_common::get_sdf_param_if_available (SdfPtrT &sdf, const
                                                         std::string &parameter_name, T &value)
```

Template Function `rmf_building_sim_common::get_sdf_param_required`

- Defined in `file_latest_rmf_building_sim_common_include_rmf_building_sim_common_utils.hpp`

Function Documentation

```
template<typename T, typename SdfPtrT>
bool rmf_building_sim_common::get_sdf_param_required (SdfPtrT &sdf, const std::string
                                                         &parameter_name, T &value)
```

Function `rmf_plugins_utils::compute_desired_rate_of_change`

- Defined in `file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp`

Function Documentation

```
double rmf_plugins_utils::compute_desired_rate_of_change (double _s_target, double
                                                           _v_actual, const Motion-
                                                           Params &_motion_params,
                                                           const double _dt)
```

Function `rmf_plugins_utils::compute_ds`

- Defined in `file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp`

Function Documentation

```
double rmf_plugins_utils::compute_ds (double s_target, double v_actual, const double v_max,
                                       const double accel_nom, const double accel_max,
                                       const double dt, const double v_target = 0.0)
```

Template Function `rmf_plugins_utils::convert(const Eigen::Quaterniond&, IgnQuatT&)`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename IgnQuatT>
inline void rmf_plugins_utils::convert (const Eigen::Quaterniond &_q, IgnQuatT &quat)
```

Template Function `rmf_plugins_utils::convert(const Eigen::Vector3d&, IgnVec3T&)`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename IgnVec3T>
inline void rmf_plugins_utils::convert (const Eigen::Vector3d &_v, IgnVec3T &vec)
```

Template Function `rmf_plugins_utils::convert_pose`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename IgnPoseT>
inline Eigen::Isometry3d rmf_plugins_utils::convert_pose (const IgnPoseT &_pose)
```

Template Function `rmf_plugins_utils::convert_quat`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename IgnQuatT>
inline Eigen::Quaterniond rmf_plugins_utils::convert_quat (const IgnQuatT &_q)
```

Template Function `rmf_plugins_utils::convert_to_pose`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename IgnPoseT>
inline auto rmf_plugins_utils::convert_to_pose(const Eigen::Isometry3d &_tf)
```

Template Function `rmf_plugins_utils::convert_vec`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename IgnVec3T>
inline Eigen::Vector3d rmf_plugins_utils::convert_vec(const IgnVec3T &_v)
```

Template Function `rmf_plugins_utils::get_element_required`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename SdfPtrT, typename SdfElementPtrT>
bool rmf_plugins_utils::get_element_required(SdfPtrT &_sdf, const std::string &_element_name, SdfElementPtrT &_element)
```

Template Function `rmf_plugins_utils::get_sdf_attribute_required`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename T, typename SdfPtrT>
bool rmf_plugins_utils::get_sdf_attribute_required(SdfPtrT &_sdf, const std::string &_attribute_name, T &_value)
```

Template Function `rmf_plugins_utils::get_sdf_param_if_available`

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename T, typename SdfPtrT>
void rmf_plugins_utils::get_sdf_param_if_available(SdfPtrT &sdf, const std::string
                                                    &parameter_name, T &value)
```

Template Function rmf_plugins_utils::get_sdf_param_required

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename T, typename SdfPtrT>
bool rmf_plugins_utils::get_sdf_param_required(SdfPtrT &sdf, const std::string &param-
                                                    eter_name, T &value)
```

Template Function rmf_plugins_utils::make_response

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
template<typename ResultMsgT>
std::shared_ptr<ResultMsgT> rmf_plugins_utils::make_response(uint8_t status, const double
                                                            sim_time, const std::string
                                                            &request_guid, const
                                                            std::string &guid)
```

Function rmf_plugins_utils::simulation_now

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_utils.hpp

Function Documentation

```
rcldcpp::Time rmf_plugins_utils::simulation_now(double t)
```

Template Function rmf_robot_sim_common::get_element_val_if_present

- Defined in file_latest_rmf_robot_sim_common_include_rmf_robot_sim_common_slotcar_common.hpp

Function Documentation

```
template<typename SdfPtrT, typename valueT>
bool rmf_robot_sim_common::get_element_val_if_present (SdfPtrT &_sdf, const
                                                    std::string &_element_name,
                                                    valueT &_val)
```

1.3.5 Typedefs

Typedef crowd_simulator::AgentPtr

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_crowd_simulator_common.hpp

Typedef Documentation

```
using crowd_simulator::AgentPtr = std::shared_ptr<Menge::Agents::BaseAgent>
```

Typedef rmf_building_sim_common::DoorMode

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_door_common.hpp

Typedef Documentation

```
typedef rmf_door_msgs::msg::DoorMode rmf_building_sim_common::DoorMode
```

Typedef rmf_building_sim_common::DoorRequest

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_door_common.hpp

Typedef Documentation

```
typedef rmf_door_msgs::msg::DoorRequest rmf_building_sim_common::DoorRequest
```

Typedef rmf_building_sim_common::DoorState

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_door_common.hpp

Typedef Documentation

```
typedef rmf_door_msgs::msg::DoorState rmf_building_sim_common::DoorState
```

Typedef rmf_building_sim_common::LiftRequest

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_lift_common.hpp

Typedef Documentation

```
using rmf_building_sim_common::LiftRequest = rmf_lift_msgs::msg::LiftRequest
```

Typedef rmf_building_sim_common::LiftState

- Defined in file_latest_rmf_building_sim_common_include_rmf_building_sim_common_lift_common.hpp

Typedef Documentation

```
using rmf_building_sim_common::LiftState = rmf_lift_msgs::msg::LiftState
```


INDEX

C

crowd_simulator::AgentPose3d (C++ class), 14
 crowd_simulator::AgentPose3d::AgentPose3d (C++ function), 14
 crowd_simulator::AgentPose3d::convert_to_ign_math_pose_3d (C++ function), 15
 crowd_simulator::AgentPose3d::pitch (C++ function), 14, 15
 crowd_simulator::AgentPose3d::roll (C++ function), 14, 15
 crowd_simulator::AgentPose3d::x (C++ function), 14
 crowd_simulator::AgentPose3d::y (C++ function), 14
 crowd_simulator::AgentPose3d::yaw (C++ function), 14, 15
 crowd_simulator::AgentPose3d::z (C++ function), 14, 15
 crowd_simulator::AgentPtr (C++ type), 30
 crowd_simulator::CrowdSimInterface (C++ class), 15
 crowd_simulator::CrowdSimInterface::_model_type (C++ member), 16
 crowd_simulator::CrowdSimInterface::AnimState (C++ enum), 15
 crowd_simulator::CrowdSimInterface::AnimState::IDLE (C++ enumerator), 15
 crowd_simulator::CrowdSimInterface::AnimState::WALK (C++ enumerator), 15
 crowd_simulator::CrowdSimInterface::CrowdSimInterface (C++ function), 15
 crowd_simulator::CrowdSimInterface::enabled (C++ function), 16
 crowd_simulator::CrowdSimInterface::get_agent_pose (C++ function), 16
 crowd_simulator::CrowdSimInterface::get_num_objects (C++ function), 15
 crowd_simulator::CrowdSimInterface::get_object_by_id (C++ function), 15
 crowd_simulator::CrowdSimInterface::get_sim_time_step (C++ function), 15
 crowd_simulator::CrowdSimInterface::get_switch_animation (C++ function), 15
 crowd_simulator::CrowdSimInterface::get_switch_animation (C++ function), 15
 crowd_simulator::CrowdSimInterface::init_crowd_simulation (C++ function), 15
 crowd_simulator::CrowdSimInterface::init_ros_node (C++ function), 15
 crowd_simulator::CrowdSimInterface::logger (C++ function), 15
 crowd_simulator::CrowdSimInterface::Object (C++ struct), 7, 16
 crowd_simulator::CrowdSimInterface::Object::agent_ptr (C++ member), 7, 16
 crowd_simulator::CrowdSimInterface::Object::current_animation (C++ member), 7, 16
 crowd_simulator::CrowdSimInterface::Object::get_next_animation (C++ function), 7, 16
 crowd_simulator::CrowdSimInterface::Object::is_extended (C++ member), 7, 16
 crowd_simulator::CrowdSimInterface::Object::model_ptr (C++ member), 7, 16
 crowd_simulator::CrowdSimInterface::Object::type_name (C++ member), 7, 16
 crowd_simulator::CrowdSimInterface::ObjectPtr (C++ type), 15
 crowd_simulator::CrowdSimInterface::one_step_simulation (C++ function), 15
 crowd_simulator::CrowdSimInterface::read_sdf (C++ function), 16
 crowd_simulator::CrowdSimInterface::update_external_data (C++ function), 16
 crowd_simulator::MengeHandle (C++ class), 17
 crowd_simulator::MengeHandle::get_agent_ptr (C++ function), 17
 crowd_simulator::MengeHandle::get_agent_count (C++ function), 17
 crowd_simulator::MengeHandle::get_sim_time_step (C++ function), 17
 crowd_simulator::MengeHandle::init_and_make_simulation (C++ function), 17

```

crowd_simulator::MengeHandle::MengeHandle(rmf_building_sim_common::DoorCommon::DoorUpdateReq
    (C++ function), 17
crowd_simulator::MengeHandle::set_sim_time(rmf_building_sim_common::DoorCommon::DoorUpdateReq
    (C++ function), 17
crowd_simulator::MengeHandle::sim_step    rmf_building_sim_common::DoorCommon::DoorUpdateResu
    (C++ function), 17
crowd_simulator::ModelTypeDatabase (C++    rmf_building_sim_common::DoorCommon::DoorUpdateResu
    class), 17
crowd_simulator::ModelTypeDatabase::emplamf_building_sim_common::DoorCommon::DoorUpdateResu
    (C++ function), 18
crowd_simulator::ModelTypeDatabase::get    rmf_building_sim_common::DoorCommon::DoorUpdateResu
    (C++ function), 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorCommon::joint_names
    (C++ struct), 8, 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorCommon::logger
    (C++ member), 8, 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorCommon::make
    (C++ member), 8, 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorCommon::params
    (C++ member), 8, 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorCommon::update
    (C++ member), 8, 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorMode (C++
    (C++ member), 8, 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorRequest
    (C++ member), 8, 18
crowd_simulator::ModelTypeDatabase::Recorrmf_building_sim_common::DoorState (C++
    (C++ type), 17
crowd_simulator::ModelTypeDatabase::sizermf_building_sim_common::get_element_required
    (C++ function), 18
R
rmf_building_sim_common::compute_desired_rate(rmf_building_sim_common::get_sdf_attribute_required
    (C++ function), 25
rmf_building_sim_common::compute_ds    rmf_building_sim_common::get_sdf_param_if_available
    (C++ function), 25
rmf_building_sim_common::DoorCommon    rmf_building_sim_common::get_sdf_param_required
    (C++ class), 18
rmf_building_sim_common::DoorCommon    rmf_building_sim_common::LiftCommon
    (C++ class), 18
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::get_elevation
    (C++ struct), 8
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::get_joint_name
    (C++ member), 9
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::LiftUpdateResu
    (C++ member), 9
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::LiftUpdateResu
    (C++ member), 9
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::LiftUpdateResu
    (C++ function), 8
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::logger
    (C++ member), 9
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::make
    (C++ struct), 9, 19
rmf_building_sim_common::DoorCommon::DoorElement    rmf_building_sim_common::LiftCommon::motion_state_
    (C++ member), 9, 19

```

```

rmf_building_sim_common::LiftCommon::update         rmf_dispenser_common::TeleportDispenserCommon::ros_
  (C++ function), 19                                (C++ member), 21
rmf_building_sim_common::LiftRequest                 rmf_dispenser_common::TeleportDispenserCommon::send
  (C++ type), 31                                    (C++ function), 20
rmf_building_sim_common::LiftState (C++             rmf_dispenser_common::TeleportDispenserCommon::sim
  type), 31                                          (C++ member), 21
rmf_building_sim_common::MotionParams               rmf_ingestor_common::TeleportIngestorCommon
  (C++ struct), 10                                (C++ class), 21
rmf_building_sim_common::MotionParams::arm          rmf_ingestor_common::TeleportIngestorCommon::_guid
  (C++ member), 10                                (C++ member), 22
rmf_building_sim_common::MotionParams::arm6         rmf_ingestor_common::TeleportIngestorCommon::curren
  (C++ member), 10                                (C++ member), 22
rmf_building_sim_common::MotionParams::dx          rmf_ingestor_common::TeleportIngestorCommon::fleet_
  (C++ member), 10                                (C++ function), 21
rmf_building_sim_common::MotionParams::fr          rmf_ingestor_common::TeleportIngestorCommon::fleet_
  (C++ member), 10                                (C++ member), 22
rmf_building_sim_common::MotionParams::vr          rmf_ingestor_common::TeleportIngestorCommon::FleetS
  (C++ member), 10                                (C++ type), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::FleetS
  (C++ class), 20                                (C++ type), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::ingest
  (C++ member), 21                                (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::ingest
  (C++ member), 21                                (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::ingest
  (C++ member), 21                                (C++ function), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::Ingest
  (C++ function), 20                              (C++ type), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::Ingest
  (C++ type), 20                                  (C++ type), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::Ingest
  (C++ type), 20                                  (C++ type), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::init_
  (C++ type), 20                                  (C++ function), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::last_
  (C++ function), 20                              (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::last_p
  (C++ member), 21                                (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::latest
  (C++ type), 20                                  (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::non_st
  (C++ type), 20                                  (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::on_upo
  (C++ member), 21                                (C++ function), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::ros_no
  (C++ function), 20                              (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::send_
  (C++ member), 21                                (C++ function), 21
rmf_dispenser_common::TeleportDispenserCommon      rmf_ingestor_common::TeleportIngestorCommon::sim_t
  (C++ member), 21                                (C++ member), 22
rmf_dispenser_common::TeleportDispenserCommon      rmf_plugins::compute_desired_rate_of_change
  (C++ member), 21                                (C++ function), 26
rmf_dispenser_common::TeleportDispenserCommon      rmf_plugins::compute_ds (C++ func-
  (C++ function), 20                              tion), 26

```

rmf_plugins_utils::convert (C++ <i>function</i>), 27	rmf_readonly_common::ReadOnlyCommon (C++ <i>class</i>), 22
rmf_plugins_utils::convert_pose (C++ <i>function</i>), 27	rmf_readonly_common::ReadOnlyCommon::BuildingMap (C++ <i>type</i>), 22
rmf_plugins_utils::convert_quat (C++ <i>function</i>), 27	rmf_readonly_common::ReadOnlyCommon::get_name (C++ <i>function</i>), 22
rmf_plugins_utils::convert_to_pose (C++ <i>function</i>), 28	rmf_readonly_common::ReadOnlyCommon::Graph (C++ <i>type</i>), 22
rmf_plugins_utils::convert_vec (C++ <i>func-</i> <i>tion</i>), 28	rmf_readonly_common::ReadOnlyCommon::init (C++ <i>function</i>), 22
rmf_plugins_utils::get_element_required (C++ <i>function</i>), 28	rmf_readonly_common::ReadOnlyCommon::Level (C++ <i>type</i>), 22
rmf_plugins_utils::get_sdf_attribute_required (C++ <i>function</i>), 28	rmf_readonly_common::ReadOnlyCommon::Location (C++ <i>type</i>), 22
rmf_plugins_utils::get_sdf_param_if_availa- ble (C++ <i>function</i>), 29	rmf_readonly_common::ReadOnlyCommon::logger (C++ <i>function</i>), 22
rmf_plugins_utils::get_sdf_param_required (C++ <i>function</i>), 29	rmf_readonly_common::ReadOnlyCommon::on_update (C++ <i>function</i>), 22
rmf_plugins_utils::make_response (C++ <i>function</i>), 29	rmf_readonly_common::ReadOnlyCommon::Path (C++ <i>type</i>), 22
rmf_plugins_utils::MotionParams (C++ <i>struct</i>), 11	rmf_readonly_common::ReadOnlyCommon::read_sdf (C++ <i>function</i>), 22
rmf_plugins_utils::MotionParams::a_max (C++ <i>member</i>), 11	rmf_readonly_common::ReadOnlyCommon::ros_node (C++ <i>member</i>), 23
rmf_plugins_utils::MotionParams::a_nom (C++ <i>member</i>), 11	rmf_readonly_common::ReadOnlyCommon::set_name (C++ <i>function</i>), 22
rmf_plugins_utils::MotionParams::dx_min (C++ <i>member</i>), 11	rmf_robot_sim_common::AckermannTrajectory (C++ <i>struct</i>), 12
rmf_plugins_utils::MotionParams::f_max (C++ <i>member</i>), 11	rmf_robot_sim_common::AckermannTrajectory::Ackerman (C++ <i>function</i>), 12
rmf_plugins_utils::MotionParams::v_max (C++ <i>member</i>), 11	rmf_robot_sim_common::AckermannTrajectory::turning (C++ <i>member</i>), 12
rmf_plugins_utils::SimEntity (C++ <i>struct</i>), 11	rmf_robot_sim_common::AckermannTrajectory::v0 (C++ <i>member</i>), 12
rmf_plugins_utils::SimEntity::entity (C++ <i>member</i>), 11	rmf_robot_sim_common::AckermannTrajectory::v1 (C++ <i>member</i>), 12
rmf_plugins_utils::SimEntity::get_entity (C++ <i>function</i>), 11	rmf_robot_sim_common::AckermannTrajectory::x0 (C++ <i>member</i>), 12
rmf_plugins_utils::SimEntity::get_name (C++ <i>function</i>), 11	rmf_robot_sim_common::AckermannTrajectory::x1 (C++ <i>member</i>), 12
rmf_plugins_utils::SimEntity::name (C++ <i>member</i>), 11	rmf_robot_sim_common::get_element_val_if_present (C++ <i>function</i>), 30
rmf_plugins_utils::SimEntity::sim_type (C++ <i>member</i>), 11	rmf_robot_sim_common::SlotcarCommon (C++ <i>class</i>), 23
rmf_plugins_utils::SimEntity::SimEntity (C++ <i>function</i>), 11	rmf_robot_sim_common::SlotcarCommon::calculate_cont (C++ <i>function</i>), 23
rmf_plugins_utils::simulation_now (C++ <i>function</i>), 29	rmf_robot_sim_common::SlotcarCommon::calculate_joi (C++ <i>function</i>), 23
rmf_plugins_utils::Simulator (C++ <i>enum</i>), 24	rmf_robot_sim_common::SlotcarCommon::charge_state_c (C++ <i>function</i>), 23
rmf_plugins_utils::Simulator::Gazebo (C++ <i>enumerator</i>), 24	rmf_robot_sim_common::SlotcarCommon::ChargerWaypoi (C++ <i>struct</i>), 12
rmf_plugins_utils::Simulator::Ignition (C++ <i>enumerator</i>), 24	rmf_robot_sim_common::SlotcarCommon::ChargerWaypoi (C++ <i>function</i>), 12

```

rmf_robot_sim_common::SlotcarCommon::ChargerWaypoint::TrajectoryPoint::pos
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::ChargerWaypoint::TrajectoryPoint::quat
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::emergency_stop::TrajectoryPoint::TrajectoryP
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::init_ros_node
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::logger
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::model_name
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::PowerParams
    (C++ struct), 13
rmf_robot_sim_common::SlotcarCommon::PowerParams::charging_current
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::PowerParams::friction_coefficient
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::PowerParams::inertia
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::PowerParams::mass
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::PowerParams::nominal_capacity
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::PowerParams::nominal_power
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::PowerParams::nominal_voltage
    (C++ member), 13
rmf_robot_sim_common::SlotcarCommon::publish_robot_state
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::read_sdf
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::set_model_name
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::SlotcarCommon
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::update
    (C++ function), 23
rmf_robot_sim_common::SlotcarCommon::UpdateResult
    (C++ struct), 13, 23
rmf_robot_sim_common::SlotcarCommon::UpdateResult::speed
    (C++ member), 14, 24
rmf_robot_sim_common::SlotcarCommon::UpdateResult::v
    (C++ member), 14, 24
rmf_robot_sim_common::SlotcarCommon::UpdateResult::w
    (C++ member), 14, 24
rmf_robot_sim_common::SteeringType (C++
    enum), 24
rmf_robot_sim_common::SteeringType::ACKERMANN
    (C++ enumerator), 24
rmf_robot_sim_common::SteeringType::DIFF_DRIVE
    (C++ enumerator), 24
rmf_robot_sim_common::TrajectoryPoint
    (C++ struct), 14

```