ROS 2 NDT

Generated by Doxygen 1.8.11

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1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 3

Class Index

3.1 Class List

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

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

Chapter 5

Namespace Documentation

5.1 ndt_matching Namespace Reference

Classes

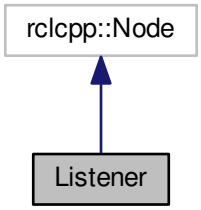
- class NdtLib

Chapter 6

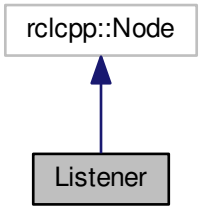
Class Documentation

6.1 Listener Class Reference

Inheritance diagram for Listener:



Collaboration diagram for Listener:



Public Member Functions

- Listener (const std::string &topic_name, const std::string &topic_name2="map")

6.1.1 Constructor & Destructor Documentation

6.1.1.1 Listener::Listener (const std::string & *topic_name,* const std::string & *topic_name2* = "map") [inline], [explicit]

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

- /home/id314/ndt_ws/src/ndt_matching/src/ndt_node.cpp

6.2 ndt_matching::NdtLib Class Reference

`#include <ndt_lib.hpp>`

Public Member Functions

- NdtLib ()
- virtual ~NdtLib ()
- int update_map (const sensor_msgs::msg::PointCloud2::SharedPtr msg)
- auto align_scan (const sensor_msgs::msg::PointCloud2::SharedPtr msg)

6.2.1 Constructor & Destructor Documentation

6.2.1.1 ndt_matching::NdtLib::NdtLib ( )

6.2.1.2 ndt_matching::NdtLib::~NdtLib ( ) [virtual]

6.2.2 Member Function Documentation

6.2.2.1 auto ndt_matching::NdtLib::align_scan (const sensor_msgs::msg::PointCloud2::SharedPtr *msg*)

This function attempts to align an input point cloud with the current reference map.

This function accepts a PointCloud2 sensor message and aligns it with the current reference map using a 3D NDT algorithm.

The PointCloud will be parsed using PCL and Eigen and iterated until the change in estimated pose between iterations is less than .0001 Meters/Radians. For explanation of the algorithm used, see: M. Magnusson, A. Lilienthal, Scan Registration for Autonomous Mining Vehicles Using 3D-NDT, 2007, Wiley Periodicals

6.2.2.2 int ndt_matching::NdtLib::update_map (const sensor_msgs::msg::PointCloud2::SharedPtr *msg*)

This function loads a pcd file and segments the resulting point cloud data to be used as a reference map for the NDT Algorithm.

This function accepts a string containing the absolute path and name of a pcd input file. The contents of the file will be segmented into cubic meter cells and the metadata of each cell calculated and saved into the parent NdtLib object Returns an int indicating success (0) or error (1).

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

- /home/id314/ndt_ws/src/ndt_matching/include/ndt_matching/ndt_lib.hpp
- /home/id314/ndt_ws/src/ndt_matching/src/ndt_lib.cpp

Chapter 7

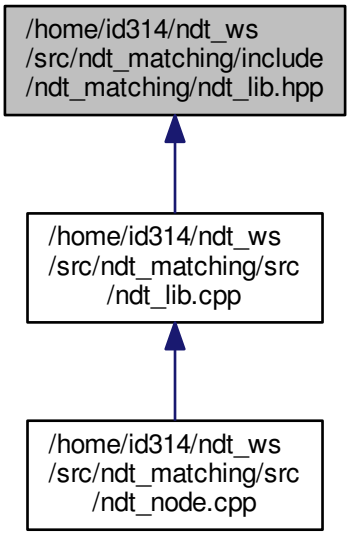
File Documentation

7.1 /home/id314/ndt_ws/src/ndt_matching/include/ndt_matching/ndt_lib.hpp File Reference

```
#include "ndt_matching/visibility_control.h"
#include <ament_index_cpp/get_package_share_directory.hpp>
#include <eigen3/Eigen/Dense>
#include <pcl/io/pcd_io.h>
#include <pcl/point_types.h>
#include <pcl_conversions/pcl_conversions.h>
#include "rclcpp/rclcpp.hpp"
#include "std_msgs/msg/string.hpp"
#include <sensor_msgs/msg/point_cloud2.hpp>
#include <geometry_msgs/msg/pose.hpp>
```

Include dependency graph for ndt_lib.hpp:

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



Classes

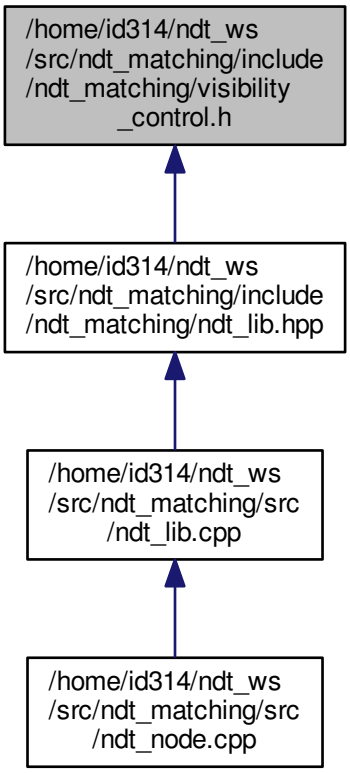
- class ndt_matching::NdtLib

Namespaces

- ndt_matching

7.2 /home/id314/ndt_ws/src/ndt_matching/include/ndt_matching/visibility_control.h File Reference

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



Macros

- #define NDT_MATCHING_EXPORT __attribute__ ((visibility("default")))
- #define NDT_MATCHING_IMPORT
- #define NDT_MATCHING_PUBLIC
- #define NDT_MATCHING_LOCAL
- #define NDT_MATCHING_PUBLIC_TYPE

7.2.1 Macro Definition Documentation

7.2.1.1 #define NDT_MATCHING_EXPORT __attribute__ ((visibility("default")))

7.2.1.2 #define NDT_MATCHING_IMPORT

7.2.1.3 #define NDT_MATCHING_LOCAL

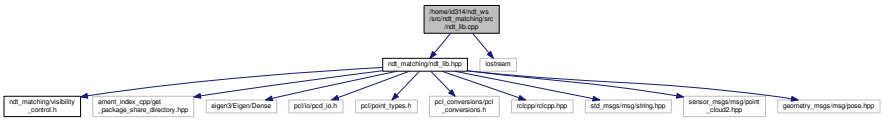
7.2.1.4 #define NDT_MATCHING_PUBLIC

7.2.1.5 #define NDT_MATCHING_PUBLIC_TYPE

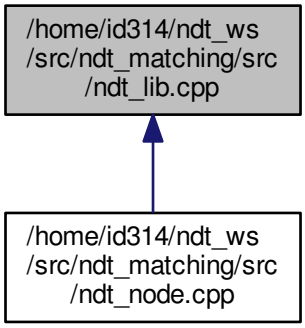
7.3 /home/id314/ndt_ws/src/ndt_matching/src/ndt_lib.cpp File Reference

```
#include "ndt_matching/ndt_lib.hpp"
#include <iostream>
```

Include dependency graph for ndt_lib.cpp:



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



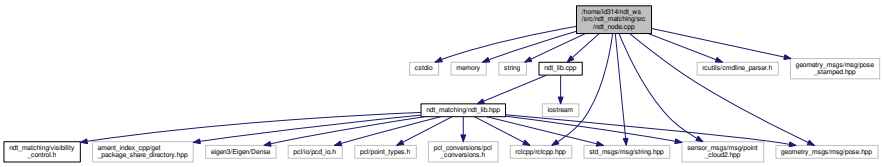
Namespaces

- ndt_matching

7.4 /home/id314/ndt_ws/src/ndt_matching/src/ndt_node.cpp File Reference

```
#include <cstdio>
#include <memory>
#include <string>
#include "ndt_lib.cpp"
#include "rclcpp/rclcpp.hpp"
#include "rcutils/cmdline_parser.h"
#include "std_msgs/msg/string.hpp"
#include <sensor_msgs/msg/point_cloud2.hpp>
#include <geometry_msgs/msg/pose.hpp>
#include <geometry_msgs/msg/pose_stamped.hpp>
```

Include dependency graph for ndt_node.cpp:



Classes

- class Listener

Functions

- void print_usage ()
- int main (int argc, char ∗argv[ ])

7.4.1 Function Documentation

7.4.1.1 int main (int *argc,* char ∗ *argv[ ]*)

7.4.1.2 void print_usage ( )

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