Pose Estimation

Generated by Doxygen 1.8.6

Thu Nov 6 2014 14:18:17

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1.1 Class List

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

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

Chapter 3

Class Documentation

3.1 Candidate Class Reference

Describes a single candidate object to the query.

`#include <PoseEstimation_interface.h>`

Public Member Functions

- Candidate ()
- Candidate (string &, PointCloud< PointXYZRGBA > &)
- Candidate (string &, PointCloud< PointXYZRGBA >::Ptr)
- void setRank (float)
- void getRank (float &)
- void setDistance (float)
- void getDistance (float &)
- void setRMSE (float)
- void getRMSE (float &)
- void getTransformation (Eigen::Matrix4f &)
- void setTransformation (Eigen::Matrix4f)

Friends

- class PoseEstimation

3.1.1 Detailed Description

Describes a single candidate object to the query.

Author

Federico Spinelli

3.1.2 Constructor & Destructor Documentation

3.1.2.1 Candidate::Candidate ( )

3.1.2.2 Candidate::Candidate (string & *str,* PointCloud< PointXYZRGBA > & *cl*)

3.1.2.3 Candidate::Candidate (string & *str,* PointCloud< PointXYZRGBA >::Ptr *clp*)

3.1.3 Member Function Documentation

3.1.3.1 void Candidate::getDistance (float & *d*)

3.1.3.2 void Candidate::getRank (float & *r*)

3.1.3.3 void Candidate::getRMSE (float & *r*)

3.1.3.4 void Candidate::getTransformation (Eigen::Matrix4f & *t*)

3.1.3.5 void Candidate::setDistance (float *d*)

3.1.3.6 void Candidate::setRank (float *r*)

3.1.3.7 void Candidate::setRMSE (float *r*)

3.1.3.8 void Candidate::setTransformation (Eigen::Matrix4f *t*)

3.1.4 Friends And Related Function Documentation

3.1.4.1 friend class PoseEstimation [friend]

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

- include/PoseEstimation_interface.h
- include/PoseEstimation_interface.hpp

3.2 PoseDB Class Reference

Stores the database of poses for Pose Estimation.

`#include <PoseEstimation_interface.h>`

Public Member Functions

- PoseDB ()

  Default empty Constructor.
- PoseDB (boost::filesystem::path pathDB)

  Constructor that loads database from disk.
- void load (boost::filesystem::path pathDB)

  Load a database from disk, knowing its location.
- void save (boost::filesystem::path pathDB)

  Save a database to disk.
- void create (boost::filesystempath::path pathClouds)

  Compute the whole database from scratch and store it in memory, CAN TAKE SEVERAL MINUTES...

Friends

- class PoseEstimation

3.2.1 Detailed Description

Stores the database of poses for Pose Estimation.

Author

Federico Spinelli

3.2.2 Constructor & Destructor Documentation

3.2.2.1 PoseDB::PoseDB ( ) [inline]

Default empty Constructor.

3.2.2.2 PoseDB::PoseDB (boost::filesystem::path *pathDB*)

Constructor that loads database from disk.

Parameters

in	*pathDB*	Path to the directory containing the database of poses

3.2.3 Member Function Documentation

3.2.3.1 void PoseDB::create (boost::filesystempath::path *pathClouds*)

Compute the whole database from scratch and store it in memory, CAN TAKE SEVERAL MINUTES...

Parameters

in	*pathClouds*	Path to a directory on disk that contains all the pcd files of object poses Note: pcd files must follow a naming convention, that is obj_name_latitude-_longitude.pcd (i.e. funnel_20_30.pcd)

3.2.3.2 void PoseDB::load (boost::filesystem::path *pathDB*)

Load a database from disk, knowing its location.

Parameters

in	*pathDB*	Path to the directory containing the database of poses

3.2.3.3 void PoseDB::save (boost::filesystem::path *pathDB*)

Save a database to disk.

Parameters

in	*pathDB*	Path to a directory on disk, inside which to save the database, directory must be empty or non existent

3.2.4 Friends And Related Function Documentation

3.2.4.1 friend class PoseEstimation [friend]

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

- include/PoseEstimation_interface.h

3.3 PoseEstimation Class Reference

`#include <PoseEstimation_interface.h>`

Public Member Functions

- PoseEstimation ()
- void setParam (string, float)
- void setParam (string str, int v)
- void initParams (boost::filesystem::path)
- PoseEstimation (boost::filesystem::path config_file)
- void setQueryViewpoint (float, float, float)
- void setQuery (string, PointCloud< PointXYZRGBA > &)
- void setQuery (string str, PointCloud< PointXYZRGBA >::Ptr clp)
- void printParams ()
- void setDatabase (boost::filesystem::path dbPath)
- void generateLists (boost::filesystem::path dbPath)
- void generateLists ()

3.3.1 Constructor & Destructor Documentation

3.3.1.1 PoseEstimation::PoseEstimation ( )

3.3.1.2 PoseEstimation::PoseEstimation (boost::filesystem::path *config_file*) [inline]

3.3.2 Member Function Documentation

3.3.2.1 void PoseEstimation::generateLists (boost::filesystem::path *dbPath*)

3.3.2.2 void PoseEstimation::generateLists ( )

3.3.2.3 void PoseEstimation::initParams (boost::filesystem::path)

3.3.2.4 void PoseEstimation::printParams ( )

3.3.2.5 void PoseEstimation::setDatabase (boost::filesystem::path *dbPath*)

3.3.2.6 void PoseEstimation::setParam (string *key,* float *value*)

3.3.2.7 void PoseEstimation::setParam (string *str,* int *v*) [inline]

3.3.2.8 void PoseEstimation::setQuery (string *str,* PointCloud< PointXYZRGBA > & *cl*)

3.3.2.9 void PoseEstimation::setQuery (string *str,* PointCloud< PointXYZRGBA >::Ptr *clp*)

3.3.2.10 void PoseEstimation::setQueryViewpoint (float *x,* float *y,* float *z*)

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

- include/PoseEstimation_interface.h
- include/PoseEstimation_interface.hpp

Chapter 4

File Documentation

4.1 include/PoseEstimation_interface.h File Reference

```
#include <iostream>
#include <pcl/point_types.h>
#include <pcl/point_cloud.h>
#include <boost/filesystem.hpp>
#include <string>
#include <unordered_map>
```

Classes

- class PoseDB

  Stores the database of poses for Pose Estimation.

- class Candidate

  Describes a single candidate object to the query.

- class PoseEstimation

4.2 include/PoseEstimation_interface.hpp File Reference

```
#include <pcl/io/pcd_io.h>
#include <pcl/common/norms.h>
#include <pcl/common/time.h>
#include <pcl/console/print.h>
#include <pcl/surface/mls.h>
#include <pcl/search/kdtree.h>
#include <pcl/features/normal_3d_omp.h>
#include <pcl/filters/statistical_outlier_removal.h>
#include <pcl/features/vfh.h>
#include <pcl/features/esf.h>
#include <pcl/features/cvfh.h>
#include <pcl/features/our_cvfh.h>
#include <pcl/filters/voxel_grid.h>
#include <pcl/registration/icp.h>
#include <pcl/visualization/pcl_visualizer.h>
#include <flann/flann.h>
#include <flann/io/hdf5.h>
#include <boost/algorithm/string/split.hpp>
#include <boost/algorithm/string/trim.hpp>
#include <algorithm>
#include <fstream>
#include <cmath>
#include <stdexcept>
#include <pcl/common/centroid.h>
#include "PoseEstimation_interface.h"
```

Macros

- #define D2R 0.017453293

4.2.1 Macro Definition Documentation

4.2.1.1 #define D2R 0.017453293

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