Image-Based Indoor Topological Navigation with Collision Avoidance for Pepper Robot

Documentation of pepper_navigation repository
https://github.com/suuman/pepper_navigation.git

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Chapter 1

Pepper_navigation

This repository contains the source code accompanying our paper Image-Based Indoor Topological Navigation with Collision Avoidance for Resource-Constrained Mobile Robots as discussed in [paper_link].

The code is open source. The codes are provided "as-is" without any warranty. Before using the code, you agree to use the code at your own risk. The authors are not responsible or liable for any damages incurred using this code.

1.1 Dependencies

1. `MATLAB` (for mapping, has to be downloaded separately),
2. `OpenCV` (available in ppa of Ubuntu or has to be built from `source` with `extra modules`),
3. `Boost` (available in ppa of Ubuntu or has to be built from `source`),
4. `naoqi_libqi` and `naoqi_libqicore` (ROS Packages available for Kinetic and Melodic),
5. `ARPACK++`, `ARPACK`, `BLAS`, `LAPACK`, and `SuperLU` (for line segment matching, available in ppa of Ubuntu),
6. `Qt5` (`Core`, `Widgets`, `Test`) (for GUI, available in ppa of Ubuntu),
7. `Graphviz` (`GVC`, `CGRAPH`, `CDT`) (for visualising topological graph, available in ppa of Ubuntu),
8. `Pepper Virtual Machine` and `VirtualBox` (to compile binaries that can run onboard on the Pepper Robot, has to be downloaded separately),
9. `qgv` and `pepper_qi` (custom libraries that are shipped with this repository).

1.2 Build Instructions

1. Get Source codes from the repository.

```
$ git clone  https://github.com/suuman/pepper_navigation.git
```

2. Install required dependencies (if required).

```
$ sudo apt install libopencv-dev libopencv-contrib-dev libboost-all-dev
$ sudo apt install ros-melodic-naoqi-libqi ros-melodic-naoqi-libqicore
s sudo apt install libarpack++2-dev libarpack2-dev libblas-dev liblapack-dev libsuperlu-dev

$ sudo apt install qt5-default
$ sudo apt install libcdt5 libcgraph6 libcgv6 libgraphviz-dev
```

3. Build executables required for mapping.

```
$ cd pepper_navigation/mapping
$ ./build_linematching.sh
```

The above command will build executables ***detectinesED*** and ***matchlines*** to $./linematching$ folder and is equivalent to the following commands

```
$ cd linematching/Linematching_iso && mkdir build $$ cd build
$ cmake ..  && make -j8
```

4. Build Navigation code

```
$ cd pepper_navigation
$ ./compile.sh
```

The above command will build executables in the *build/* directory and is equivalent to the following commands

```
$ mkdir build $$ cd build
$ cmake ..  && make -j8
```

If the CMake options and Path has to be changed from the default

```
$ ccmake ..  or cmake-gui ..
```

Configure and Generate Makefile.

```
$ make -j8
```

Following executables will be built

1. ***peppernav_gui*** => GUI version of the topological navigation of the Pepper robot. It has to be executed on the external PC connecting to the Pepper robot remotely.

2. ***peppernav_inside*** => Topological navigation of the Pepper robot. It is capable of running onboard on the Pepper robot.

3. ***peppernavigation*** => Navigation of the Pepper robot along the single reference image list. It is capable of running onboard on Pepper robot.

4. ***peppernavigationoff*** => Offline localisation mode from the image sequence. It does not require a robot (Images read from the folder).

Note: To run the executables ***peppernav_inside*** and ***peppernavigation*** onboard on the Pepper robot, they must be compiled in the `Pepper Virtual Machine`. For details, please refer to the `Reference Manual` in $../docs$ folder.

1.3 Run Code

Example Scripts: *`run_onboard.sh`*, *`run_remotePC.sh`*, and *`run_offline.sh`*.

The navigation executables require two arguments:
a. Path of topological map (e.g. `../data/tmap`), and
b. IP address of the robot (e.g. `172.19.226.236` to run online with robot) or path of the image sequence (e.g. `../data/offlinetest`) to run offline with image sequence (localisation mode only).

For details, please refer to `docs/Pepper_Navigation_Reference_Manual.pdf` and README.MD at sub-folders of this repository.

1.4 References

[1] Bista SR, Ward B, Corke P. Image-Based Indoor Topological Navigation with Collision Avoidance for Resource-Constrained Mobile Robots.

[2] Bista SR, Giordano PR, Chaumette F. Appearance-based indoor navigation by IBVS using line segments. IEEE Robotics and Automation Letters. 2016 Jan 26;1(1):423-30.

Chapter 2

navmain

Top-level interface for the navigation.

2.1 Dependencies

- `OpenCV`,
- `Boost`,
- `naoqi_libqi`, `naoqi_libqicore` and `pepper_qi` (Please refer to *../pepper_qi* folder for details),
- `Qt5`, `qgv` and `Graphviz` (Please refer to *../qgv* folder for details).

2.2 Usage

2.2.1 Libraries

1. ***navigation*** (*navigation.h*, *navigation.cpp*) => Top-level interface for Image-based navigation using line segments (*../linenav*)
2. ***peppernavigation*** (*peppernavigation.h*) => Top-level Interface for the Pepper robot Navigation. Top-level functions for `free-space navigation` and `image-based navigation`.
3. ***pepperInterface*** (*pepperInterface.h*, *pepperInterface.cpp*) => Virtual class with top-level virtual functions for interface with the Pepper robot or just image sequences.
   - ***pepperRobot*** (*pepperRobot.h*, *pepperRobot.cpp*) => Derived Class to Interface with the Peper robot.
   - ***pepperRobotVirtual*** (*pepperRobotVirtual.h*, *pepperRobotVirtual.cpp*) => Derived Class to test ***pepperRobot*** functionalities via Virtual Pepper where images are read from the folder.
   - ***pepperOffline*** (*pepperOffline.h*, *pepperOffline.cpp*) => Derived Class to Interface in offline mode i.e. read images from the folder and perform image-based localisation only (Pepper robot not used).
4. ***topmapprocessor*** (*topograph_processor.h*) => Top-level interface for processing topological map (reads topological graph and reference images from disk for navigation).
5. ***astar*** (*topograph_astar.h*) => Performs A$*$ search in the graph. Modified code from `Boost Graph Library example : astar-cities`).
6. ***pepperServices*** (*pepperevents.h*) => Subscribe to Pepper robot's internal events related to move and collision.

2.2.2 Executables

1. ***peppernav_gui*** (`nav_peppergui.cpp`) => Topological navigation of the Pepper robot with GUI. The code has to be executed on the external PC connecting to the Pepper robot remotely.

2. ***peppernav_inside*** (`nav_pepper_inside.cpp`) => Topological naviagtion of the Pepper robot. This code is capable to run onboard on the Pepper robot.

3. ***peppernavigation*** (`nav_pepperonline.cpp`) => Image-based Naviagtion of the Pepper robot along the single reference image list.

4. ***peppernavigationoff*** (`pepperOffline.cpp`) => Image-based Localisation along the reference image list. This is the offline mode that uses image sequence and does not require the robot.

   Note: The executables *peppernav_inside* and *peppernavigation* are capable of running onboard on the Pepper robot provided that they are compiled in the `Pepper Virtual Machine` [1]. For details, please refer to the `Reference Manual` in *../docs* **folder.**

[1] G. Suddrey, A. Jacobson and B. Ward. "Enabling a pepper robot to provide automated and interactive tours of a robotics laboratory." arXiv preprint `arXiv:1804.03288` (2018). `ACRA 2018 Proceedings`. `https://bitbucket.org/pepper_qut/virtual-machine.git`.

Chapter 3

navmain/maingui

- Interface for Topological Navigation.
- GUI version of topological navigation runs on a remote PC. The code communicates with the Peper robot remotely via the naoqi interface.
- Non-GUI version of topological navigation is capable of running onboard on the Pepper robot if the code is complied in the `Pepper Virtual Machine`.

Topological Navigation

navwindow (*`navwindow.h`*, *`navwindow.cpp`*, *`navwindow.ui`*) => Navigation with GUI control. Requires Qt5 and qgv libaries.
navinside (*`navinside.h`*, *`navinside.cpp`*) => Navigation without GUI. Can be used to run navigation onboard on the Pepper robot.
Please refer to *../../CMakeLists.txt*.

window_QT and files_Qt

Uses OpenCV for displaying the image in QT UI.
Code taken from `OpenCV highgui module repository`.

Usage

Please refer to the `Reference Manual` in *../docs* folder.

Chapter 4

depthnav

4.1 Free-space navigation using depth image

Navigation in the drivable free space using 2D occupancy grid map obtained from depth image.

4.2 Dependencies

- OpenCV,
- Boost,
- naoqi_libqi, naoqi_libqicore and pepper_qi (Please refer to ../*pepper_qi* folder for details).

4.3 Usage

I. Standalone usage

Refer *depthnav_Pepper.cpp*

```
$ mkdir build $$ cd build
$ cmake ..  && make -j8
$ ./pepper_fsnav --ip < Pepper_IP >
```

II. As library

1. To use the depthnav library, please refer to class ***freespacenavigation*** (*freespacenavigation.h*, *freespacenavigation.cpp*).

2. Other classes and functions:

   - ***depthimagescanner*** (*DepthImageScanner.h*, *DepthImageScanner.cpp*) => Creates 2D grid map from depth image.
   - ***depth_traits*** (*depth_traits.h*) => Template function to process depth image obtained from ros *depthimage_to_laserscan* library.
   - ***pepperlaser*** (*pepperlaser.h*) => Defines Pepper robot's Laser Memory Keys.
   - ***alpose2d*** (*alpose2d.h*, *alpose2d.cpp*) => *libalmath* Pose2D library used to process odometry data from the Pepper robot.

Chapter 5

linenav

5.1 Image-based navigation using line segments

https://github.com/suuman/line_navigation_offline.git

Bista SR, Giordano PR, Chaumette F. Appearance-based indoor navigation by IBVS using line segments. IEEE Robotics and Automation Letters. 2016 Jan 26;1(1):423-30.

5.2 Dependencies

1. OpenCV,
2. Line matching code is based on http://www.mip.informatik.uni-kiel.de/tiki-download%20file. php?fileId=1965 (offline now but availabe in OpenCV),

1. BIAS library is based on http://www.mip.informatik.uni-kiel.de/tiki-index.↩ php?page=BIAS (offline now),
2. ARPACK++, ARPACK, BLAS, LAPACK, SuperLU.

5.3 Usage

1. To use the original line detection and matching code based on the legacy BIAS library, use the codes inside the edlbd/ folder.
   If you do not want to use the legacy BIAS library, the line detection and matching based on OpenCV is used.
   Please refer to $../CMakeLists.txt$.
2. To use ***linenavigation*** as a library, please refer to linenavigation.h and linenavigation.cpp.
3. To display the image-based localisation via ***dispnav*** class, please refer to dispnav.h and dispnav.cpp.
4. For the usage of **linenavigation** and **dispnav**, please refer to navigation.h and navigation.cpp in $../navmain/$ directory.

Chapter 6

Mapping

6.0.1 Selection of Reference Images Based on Line Segment Matching

Bista SR, Giordano PR, Chaumette F. Appearance-based indoor navigation by IBVS using line segments. IEEE Robotics and Automation Letters. 2016 Jan 26;1(1):423-30.

https://github.com/suuman/selectKeyImagesLines.git

6.1 Build

1. Get Source codes from the repository.

```
$ git clone https://github.com/suuman/selectKeyImagesLines.git
```

2. Build executables required for mapping.

```
$ ./build_linematching.sh
```

The above command will build executables ***detectinesED*** and ***matchlines*** to $./linematching$ folder and is equivalent to the following commands

```
    $ cd linematching/Linematching_iso && mkdir build $$ cd build
    $ cmake .. && make -j8
```

6.2 Usage

The code for the mapping is in Matlab. Make sure the line detection and matching codes have been properly built and executables have been placed in the correct folder.
For selecting the reference images, we need to provide the path of the image sequence folder and the folder to store the reference images.

1. Open selectRefImages.m
2. Set the path of the image sequence. e.g imseq = '../roboroom/imgs_acquired'
3. Set the path to store the reference images. e.g refimpath='../roboroom/ref_imgs'
4. Run selectRefImages.m

The reference image folder will contain

1. Reference Images.
2. The text files with the detected line segments and their descriptors. There is one .txt file for each reference image.

6.3 Creating Toplogical Map for Naviagtion

Bista SR, Ward B, Corke P. Image-Based Indoor Topological Navigation with Collision Avoidance for Resource-Constrained Mobile Robots.

To build a topological map from reference images, please refer to the `Reference Manual` in $../docs$ folder.

Chapter 7

pepper_qi

7.1 Interface with qi library

This source code has been taken and modified for the Pepper robot

The original code is available from

- https://github.com/lagadic/visp_naoqi/tree/libqi
- https://github.com/lagadic/pepper_control/tree/libqi

Reference of the original code
E. Marchand, F. Spindler, F. Chaumette. ViSP for visual servoing: a generic software platform with a wide class of robot control skills. IEEE Robotics and Automation Magazine, Special Issue on "Software Packages for Vision-Based Control of Motion", P. Oh, D. Burschka (Eds.), 12(4):40-52, December 2005. DOI:10.1109/MRA.2005.1577023. inria-00351899. https://visp.inria.fr/
This modified code supports image acquistion from depth camera.

7.2 Dependencies

- OpenCV,
- Boost,
- naoqi_libqi (ROS library),
- naoqi_libqicore (ROS library).

Note:

- The thirdparty folder consists of source code of naoqi_libqi and naoqi_libqicore that has been modified to work with Boost version 1.65.1
- The latest code of libqi and qicore can be obtained from
  https://github.com/aldebaran/libqi
  https://github.com/aldebaran/libqicore

Chapter 8

qgv

8.1 Interactive Qt graphViz display

`https://github.com/nbergont/qgv`

8.2 Dependencies

1. `Qt5` (`Core`, `Widgets`, `Test`)
2. `Graphviz` (`GVC`, `CGRAPH`, `CDT`)

8.3 Usage

Please refer to *`libqgv_CMakeLists.txt`* in the *../cmake* folder for the usage of the qgv library in this project.

Chapter 9

Sample data for testing

9.1 offlinetest/

Contains data for offline testing (mapping and localisation)

1. `offlinetest/imgs` => contains image sequence obtained from the Pepper robot.
2. `offlinetest/kfls` => contains reference images obtained from `../mapping/select_Reference↩ Images.m` located in the *../mapping* folder.

9.2 tmap/

Contains topological map required for navigation

`tmap/conf.txt` => configuration file that defines the topological map.
This file is generated from `../mapping/generate_configfile.m` located in the *../mapping* folder.

Chapter 10

Namespace Index

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Chapter 13

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Chapter 14

Namespace Documentation

14.1 AL Namespace Reference

Namespaces

- Math

14.2 AL::Math Namespace Reference

Classes

- struct Pose2D

  A pose in a 2-dimentional space.

Functions

- float distanceSquared (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the squared distance between two Pose2D.
- float distance (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the distance between two Pose2D.
- void pose2DInverse (const Pose2D &pPos, Pose2D &pRes)

  Compute the inverse of a Pose2D.
- void pose2dInvertInPlace (Pose2D &pPos)

  Inverse the given Pose2D in place:
- Pose2D pose2dDiff (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the Pose2D between the actual Pose2D and the one give in argument result:
- Pose2D pose2DInverse (const Pose2D &pPos)

  Compute the inverse of a Pose2D.
- Pose2D pinv (const Pose2D &pPos)

  Alternative name for inverse: return the pose2d inverse of the given Pose2D.

14.2.1 Function Documentation

14.2.1.1 distance()

```
float AL::Math::distance (
             const Pose2D & pPos1,
             const Pose2D & pPos2 )
```

Compute the distance between two Pose2D.

$$\sqrt{(pPos1.x - pPos2.x)^2 + (pPos1.y - pPos2.y)^2}$$

Parameters

pPos1	the first Pose2D
pPos2	the second Pose2D

Returns

the float distance between the two Pose2D

Definition at line 174 of file alpose2d.cpp.

14.2.1.2 distanceSquared()

```
float AL::Math::distanceSquared (
             const Pose2D & pPos1,
             const Pose2D & pPos2 )
```

Compute the squared distance between two Pose2D.

$$(pPos1.x - pPos2.x)^2 + (pPos1.y - pPos2.y)^2$$

Parameters

pPos1	the first Pose2D
pPos2	the second Pose2D

Returns

the float squared distance between the two Pose2D

Definition at line 167 of file alpose2d.cpp.

14.2.1.3 pinv()

```
Pose2D AL::Math::pinv (
             const Pose2D & pPos )
```

Alternative name for inverse: return the pose2d inverse of the given Pose2D.

Parameters

pPos	the given Pose2D

Definition at line 233 of file alpose2d.cpp.

14.2.1.4 pose2dDiff()

```
Pose2D AL::Math::pose2dDiff (
             const Pose2D & pPos1,
             const Pose2D & pPos2 )
```

Compute the Pose2D between the actual Pose2D and the one give in argument result:

inverse(pPos1)∗pPos2

Parameters

pPos1	the first Pose2D
pPos2	the second Pose2D

Returns

the Pose2D

Definition at line 216 of file alpose2d.cpp.

14.2.1.5 pose2DInverse() [1/2]

```
Pose2D AL::Math::pose2DInverse (
             const Pose2D & pPos )
```

Compute the inverse of a Pose2D.

Parameters

pPos	the initial Pose2D

Returns

the inverse Pose2D

Definition at line 226 of file alpose2d.cpp.

14.2.1.6 pose2DInverse() [2/2]

```
void AL::Math::pose2DInverse (
             const Pose2D & pPos,
             Pose2D & pRes )
```

Compute the inverse of a Pose2D.

Parameters

pPos	the initial Pose2D
pRes	the inverse Pose2D

Definition at line 196 of file alpose2d.cpp.

14.2.1.7 pose2dInvertInPlace()

```
void AL::Math::pose2dInvertInPlace (
             Pose2D & pPos )
```

Inverse the given Pose2D in place:

Parameters

pPos	the given Pose2D

Definition at line 204 of file alpose2d.cpp.

14.3 astar Namespace Reference

Classes

- class astar

  The astar class.
- class astar_goal_visitor
- class distance_heuristic
- struct found_goal
- class graph_writer
- class heuristic
- struct location
- class weight_writer

Typedefs

- typedef float cost
- typedef boost::adjacency_list< boost::listS, boost::vecS, boost::undirectedS, boost::no_property, boost::property< boost::edge_weight_t, cost > > mygraph_t
- typedef boost::property_map< mygraph_t, boost::edge_weight_t >::type WeightMap
- typedef mygraph_t::vertex_descriptor vertex
- typedef mygraph_t::edge_descriptor edge_descriptor
- typedef std::pair< int, int > edge

Variables

- const typedef char ∗ node

14.3.1 Typedef Documentation

14.3.1.1 cost

```
typedef float astar::cost
```

Definition at line 50 of file topograph_astar.h.

14.3.1.2 edge

```
typedef std::pair<int, int> astar::edge
```

Definition at line 150 of file topograph_astar.h.

14.3.1.3 edge_descriptor

```
typedef mygraph_t::edge_descriptor astar::edge_descriptor
```

Definition at line 149 of file topograph_astar.h.

14.3.1.4 mygraph_t

```
typedef boost::adjacency_list<boost::listS, boost::vecS, boost::undirectedS, boost::no_property, boost↩
::property<boost::edge_weight_t, cost> > astar::mygraph_t
```

Definition at line 146 of file topograph_astar.h.

14.3.1.5 vertex

```
typedef mygraph_t::vertex_descriptor astar::vertex
```

Definition at line 148 of file topograph_astar.h.

14.3.1.6 WeightMap

```
typedef boost::property_map<mygraph_t, boost::edge_weight_t>::type astar::WeightMap
```

Definition at line 147 of file topograph_astar.h.

14.3.2 Variable Documentation

14.3.2.1 node

```
const typedef char* astar::node
```

Definition at line 51 of file topograph_astar.h.

14.4 depthimagescanner Namespace Reference

Classes

- class DepthImageScanner
- struct DepthTraits
- struct DepthTraits< float >
- struct DepthTraits< uint16_t >

14.5 tgraph Namespace Reference

Classes

- struct branch
- struct edge
- struct node

  The node struct each node has nodeid starting from 0. nodename : higher level id for node.
- class topmapprocessor

  The topmapprocessor class.
- struct topograph

  The topograph struct.

14.6 Ui Namespace Reference

Chapter 15

Class Documentation

15.1 astar::astar Class Reference

The astar class.

```
#include <topograph_astar.h>
```

Public Member Functions

- astar (int num_nodes)

  astar initilaise graph
- float getweight (int indx)

  getweight return weight of the edge
- void setlocationherustics (node ∗nodename, location ∗locat)

  setlocationherustics
- void setedges (int numedges, edge ∗edgearray, cost ∗wts)

  setedges set edges of the graph
- void creategraph ()

  creategraph creates toplogical graph from edges
- int searchingraph (int st, int gl, std::vector< int > &optpath)

  searchingraph A∗ search betwwn start node and destination node
- int searchingraphrandom (int &st, int &gl, std::vector< int > &optpath)

  searchingraphrandom A∗ search with random start and random destination
- void writegraph2file (std::string &fname)

  writegraph2file wirte graph in file in .dot format

15.1.1 Detailed Description

The astar class.

Definition at line 156 of file topograph_astar.h.

15.1.2 Constructor & Destructor Documentation

15.1.2.1 astar()

```
astar::astar::astar (
            int num_nodes )  [inline]
```

astar initilaise graph

Parameters

num_nodes	number of nodes

Definition at line 225 of file topograph_astar.h.

15.1.3 Member Function Documentation

15.1.3.1 creategraph()

```
void astar::astar::creategraph ( )  [inline]
```

creategraph creates toplogical graph from edges

Definition at line 277 of file topograph_astar.h.

15.1.3.2 getweight()

```
float astar::astar::getweight (
             int indx )  [inline]
```

getweight return weight of the edge

Parameters

indx	index of edge

Returns

weight

Definition at line 240 of file topograph_astar.h.

15.1.3.3 searchingraph()

```
int astar::astar::searchingraph (
             int st,
             int gl,
             std::vector< int > & optpath )  [inline]
```

searchingraph A∗ search betwwn start node and destination node

Parameters

st	index of start node
gl	index of destination node
optpath	node list of the optimum path

Returns

cost of the optimum path

Definition at line 296 of file topograph_astar.h.

15.1.3.4 searchingraphrandom()

```
int astar::astar::searchingraphrandom (
             int & st,
             int & gl,
             std::vector< int > & optpath )  [inline]
```

searchingraphrandom A∗ search with random start and random destination

Parameters

st	start node index => generated randomly
gl	end node index => generated randomly
optpath	node list of the optimum path

Returns

cost of the optimum path

Definition at line 315 of file topograph_astar.h.

15.1.3.5 setedges()

```
void astar::astar::setedges (
             int numedges,
             edge * edgearray,
             cost * wts )  [inline]
```

setedges set edges of the graph

Parameters

numedges	number of the edges
edgearray	egdes information
wts	weights of edges

Definition at line 262 of file topograph_astar.h.

15.1.3.6 setlocationherustics()

```
void astar::astar::setlocationherustics (
             node * nodename,
             location * locat )  [inline]
```

setlocationherustics

Definition at line 247 of file topograph_astar.h.

15.1.3.7 writegraph2file()

```
void astar::astar::writegraph2file (
             std::string & fname )  [inline]
```

writegraph2file wirte graph in file in .dot format

Parameters

fname	file name

Definition at line 334 of file topograph_astar.h.

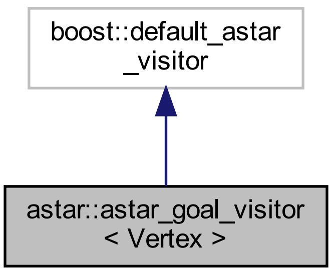
The documentation for this class was generated from the following file:

- navmain/topograph_astar.h

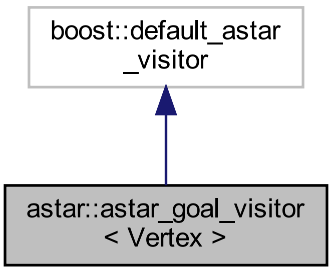
15.2 astar::astar_goal_visitor< Vertex > Class Template Reference

```
#include <topograph_astar.h>
```

Inheritance diagram for astar::astar_goal_visitor< Vertex >:


boost::default_astar _visitor
astar::astar_goal_visitor < Vertex >

Collaboration diagram for astar::astar_goal_visitor< Vertex >:



Public Member Functions

- astar_goal_visitor (Vertex goal)
- template< class Graph >
  void examine_vertex (Vertex u, Graph &g)

15.2.1 Detailed Description

template<class Vertex>
class astar::astar_goal_visitor< Vertex >

Definition at line 131 of file topograph_astar.h.

15.2.2 Constructor & Destructor Documentation

15.2.2.1 astar_goal_visitor()

```
template<class Vertex >
astar::astar_goal_visitor< Vertex >::astar_goal_visitor (
            Vertex goal )  [inline]
```

Definition at line 134 of file topograph_astar.h.

15.2.3 Member Function Documentation

15.2.3.1 examine_vertex()

```
template<class Vertex >
template<class Graph >
void astar::astar_goal_visitor< Vertex >::examine_vertex (
             Vertex u,
             Graph & g )  [inline]
```

Definition at line 136 of file topograph_astar.h.

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

- navmain/topograph_astar.h

15.3 tgraph::branch Struct Reference

```
#include <topograph_processor.h>
```

Public Attributes

- int sid
- int eid
- std::string fold
- int indx
- char diflag

15.3.1 Detailed Description

Definition at line 57 of file topograph_processor.h.

15.3.2 Member Data Documentation

15.3.2.1 diflag

```
char tgraph::branch::diflag
```

Definition at line 62 of file topograph_processor.h.

15.3.2.2 eid

```
int tgraph::branch::eid
```

Definition at line 59 of file topograph_processor.h.

15.3.2.3 fold

```
std::string tgraph::branch::fold
```

Definition at line 60 of file topograph_processor.h.

15.3.2.4 indx

```
int tgraph::branch::indx
```

Definition at line 61 of file topograph_processor.h.

15.3.2.5 sid

```
int tgraph::branch::sid
```

Definition at line 58 of file topograph_processor.h.

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

- navmain/topograph_processor.h

15.4 CompareL Struct Reference

```
#include <PairwiseLineMatching.hh>
```

Public Member Functions

- bool operator() (const double &lhs, const double &rhs) const

15.4.1 Detailed Description

Definition at line 26 of file PairwiseLineMatching.hh.

15.4.2 Member Function Documentation

15.4.2.1 operator()()

```
bool CompareL::operator() (
             const double & lhs,
             const double & rhs ) const  [inline]
```

Definition at line 27 of file PairwiseLineMatching.hh.

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

- linenav/PairwiseLineMatching.hh

15.5 CompareS Struct Reference

```
#include <PairwiseLineMatching.hh>
```

Public Member Functions

- bool operator() (const double &lhs, const double &rhs) const

15.5.1 Detailed Description

Definition at line 31 of file PairwiseLineMatching.hh.

15.5.2 Member Function Documentation

15.5.2.1 operator()()

```
bool CompareS::operator() (
             const double & lhs,
             const double & rhs ) const  [inline]
```

Definition at line 32 of file PairwiseLineMatching.hh.

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

- linenav/PairwiseLineMatching.hh

15.6 depthimagescanner::DepthImageScanner Class Reference

```
#include <DepthImageScanner.h>
```

Public Member Functions

- DepthImageScanner (cv::Mat &Kc)
- ∼DepthImageScanner ()
- void setdepthasUC ()
- void readlasersonar (qi::AnyObject memeoryproxy)
- void setImname (int ct)
- void setdepthasD ()
- void convert_msg (cv::Mat &, cv::Mat &grid, std::vector< double > &od, std::vector< double > &wr, std::vector< double > &wrl)
- void set_range_limits (const float range_min, const float range_max)
- void set_scan_height (const int scan_height)
- void set_output_frame (const std::string output_frame_id)

15.6.1 Detailed Description

Definition at line 53 of file DepthImageScanner.h.

15.6.2 Constructor & Destructor Documentation

15.6.2.1 DepthImageScanner()

```
DepthImageScanner::DepthImageScanner (
            cv::Mat & Kc )
```

constructor @params Kc instrinsic matrix of the depth camera

Definition at line 44 of file DepthImageScanner.cpp.

15.6.2.2 ∼DepthImageScanner()

```
DepthImageScanner::∼DepthImageScanner ( )
```

destructor

Definition at line 89 of file DepthImageScanner.cpp.

15.6.3 Member Function Documentation

15.6.3.1 convert_msg()

```
void DepthImageScanner::convert_msg (
            cv::Mat & depth,
            cv::Mat & grid,
            std::vector< double > & od,
            std::vector< double > & wr,
            std::vector< double > & wrl )
```

Converts depth image to 2D occupancy grid.

Parameters

depth	depth image.
grid	output grid image
od	input robot's transformation from prevous frame measured fro robot's odometry
wr,wrl	=> rotational velocity vector.

Definition at line 146 of file DepthImageScanner.cpp.

15.6.3.2 readlasersonar()

```
void DepthImageScanner::readlasersonar (
             qi::AnyObject memeoryproxy )
```

reads laser and sonar value

Parameters

memeoryproxy	memeory proxy object

Definition at line 141 of file DepthImageScanner.cpp.

15.6.3.3 set_output_frame()

```
void DepthImageScanner::set_output_frame (
             const std::string output_frame_id )
```

Sets the frame_id for the output LaserScan.

Output frame_id for the LaserScan. Will probably NOT be the same frame_id as the depth image. Example: For OpenNI cameras, this should be set to 'camera_depth_frame' while the camera uses 'camera_depth_optical_frame'.

Parameters

output_frame↩ _id	Frame_id to use for the output sensor_msgs::LaserScan.

Definition at line 218 of file DepthImageScanner.cpp.

15.6.3.4 set_range_limits()

```
void DepthImageScanner::set_range_limits (
             const float range_min,
             const float range_max )
```

Sets the minimum and maximum range for laser sacan

range_min is used to determine how close of a value to allow through when multiple radii correspond to the same angular increment. range_max is used to set the output message.

Parameters

range_min	Minimum range to assign points to the laserscan, also minimum range to use points in the output scan.
range_max	Maximum range to use points in the output scan.

Definition at line 209 of file DepthImageScanner.cpp.

15.6.3.5 set_scan_height()

```
void DepthImageScanner::set_scan_height (
             const int scan_height )
```

Sets the number of image rows to use in the output LaserScan.

scan_height is the number of rows (pixels) to use in the output. This will provide scan_height number of radii for each angular increment. The output scan will output the closest radius that is still not smaller than range_min. This function can be used to vertically compress obstacles into a single LaserScan.

Parameters

scan_height	Number of pixels centered around the center of the image to compress into the LaserScan.

Definition at line 214 of file DepthImageScanner.cpp.

15.6.3.6 setdepthasD()

```
void DepthImageScanner::setdepthasD ( )
```

sets depth as double

Definition at line 82 of file DepthImageScanner.cpp.

15.6.3.7 setdepthasUC()

```
void DepthImageScanner::setdepthasUC ( )
```

sets depth as unsigned char

Definition at line 75 of file DepthImageScanner.cpp.

15.6.3.8 setImname()

```
void DepthImageScanner::setImname (
             int ct )
```

set image name for saving

Parameters

ct	: counter for file name

Definition at line 772 of file DepthImageScanner.cpp.

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

- depthnav/DepthImageScanner.h
- depthnav/DepthImageScanner.cpp

15.7 depthimagescanner::DepthTraits< T > Struct Template Reference

```
#include <depth_traits.h>
```

15.7.1 Detailed Description

template< typename T >
struct depthimagescanner::DepthTraits< T >

Definition at line 43 of file depth_traits.h.

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

- depthnav/depth_traits.h

15.8 depthimagescanner::DepthTraits< float > Struct Reference

```
#include <depth_traits.h>
```

Static Public Member Functions

- static bool valid (float depth)
- static float toMeters (float depth)
- static float fromMeters (float depth)
- static void initializeBuffer (std::vector< uint8_t > &buffer)

15.8.1 Detailed Description

Definition at line 55 of file depth_traits.h.

15.8.2 Member Function Documentation

15.8.2.1 fromMeters()

```
static float depthimagescanner::DepthTraits< float >::fromMeters (
             float depth )  [inline], [static]
```

Definition at line 59 of file depth_traits.h.

15.8.2.2 initializeBuffer()

```
static void depthimagescanner::DepthTraits< float >::initializeBuffer (
             std::vector< uint8_t > & buffer )  [inline], [static]
```

Definition at line 61 of file depth_traits.h.

15.8.2.3 toMeters()

```
static float depthimagescanner::DepthTraits< float >::toMeters (
             float depth )  [inline], [static]
```

Definition at line 58 of file depth_traits.h.

15.8.2.4 valid()

```
static bool depthimagescanner::DepthTraits< float >::valid (
             float depth )  [inline], [static]
```

Definition at line 57 of file depth_traits.h.

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

- depthnav/depth_traits.h

15.9 depthimagescanner::DepthTraits< uint16_t > Struct Reference

```
#include <depth_traits.h>
```

Static Public Member Functions

- static bool valid (uint16_t depth)
- static float toMeters (uint16_t depth)
- static uint16_t fromMeters (float depth)
- static void initializeBuffer (std::vector< uint8_t > &buffer)

15.9.1 Detailed Description

Definition at line 46 of file depth_traits.h.

15.9.2 Member Function Documentation

15.9.2.1 fromMeters()

```
static uint16_t depthimagescanner::DepthTraits< uint16_t >::fromMeters (
             float depth )  [inline], [static]
```

Definition at line 50 of file depth_traits.h.

15.9.2.2 initializeBuffer()

```
static void depthimagescanner::DepthTraits< uint16_t >::initializeBuffer (
             std::vector< uint8_t > & buffer )  [inline], [static]
```

Definition at line 51 of file depth_traits.h.

15.9.2.3 toMeters()

```
static float depthimagescanner::DepthTraits< uint16_t >::toMeters (
             uint16_t depth )  [inline], [static]
```

Definition at line 49 of file depth_traits.h.

15.9.2.4 valid()

```
static bool depthimagescanner::DepthTraits< uint16_t >::valid (
             uint16_t depth )  [inline], [static]
```

Definition at line 48 of file depth_traits.h.

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

- depthnav/depth_traits.h

15.10 dispNav Class Reference

The dispNav class.

```
#include <dispnav.h>
```

Public Member Functions

- dispNav ()

    dispNav
- void setDisptime (int delay)

    setDisptime delay foe dispaly window
- void displayimage (bool flag)

    displayimage show navigation images
- void saveimage (bool flag)

    saveimage show navigation images
- void showfeat (bool flag)

    showfeat draw features used for ibvs in displayed image if image is displayed
- void closedisp ()

    closedisp
- void setKeyImages (std::string pkim, std::string nkim, std::string nnkim)

    setKeyImages set current reference images
- void dispNavigation (cv::Mat &Ic)

    dispNavigation
- void dispNavigation (cv::Mat &Ic, ScaleLines &cLines, ScaleLines &nLines, ScaleLines &nnLines, std::vector< std↩ ::vector< int > > &op)

    dispNavigation
- void dispImages (std::string title, cv::Mat &IP, cv::Mat &IC, cv::Mat &IN, cv::Mat &INN)

    dispImages display images in 2x2 grid window
- void dispImages (std::string title, cv::Mat &IC, cv::Mat &IK)

    dispImages dispaly two images side by side in window
- void dispImages (std::string title, cv::Mat &IC, ScaleLines linesInLeft, cv::Mat &IK, ScaleLines linesInRight, std::vector< unsigned int > matchResult)

    dispImages dispaly two images side by side in window with matched line segemnts
- void setpseudocolour (int maxlines)

    setpseudocolour gebnerate color for lines segents dispaly
- void dispImages (std::string title, cv::Mat &IP, cv::Mat &IC, cv::Mat &IN, cv::Mat &INN, ScaleLines &cLines, ScaleLines &nLines, ScaleLines &nnLines, std::vector< std::vector< int > > &op)

    dispImages display images in 2x2 grid window

Public Attributes

- int size
- int sz

15.10.1 Detailed Description

The dispNav class.

Definition at line 34 of file dispnav.h.

15.10.2 Constructor & Destructor Documentation

15.10.2.1 dispNav()

```
dispNav::dispNav ( )
```

dispNav

Definition at line 26 of file dispnav.cpp.

15.10.3 Member Function Documentation

15.10.3.1 closedisp()

```
void dispNav::closedisp ( )
```

closedisp

Definition at line 401 of file dispnav.cpp.

15.10.3.2 dispImages() [1/4]

```
void dispNav::dispImages (
             std::string title,
             cv::Mat & IC,
             cv::Mat & IK )
```

dispImages dispaly two images side by side in window

Parameters

title	title of window
IC	cv::Mat image
IK	cv::Mat image

Definition at line 256 of file dispnav.cpp.

15.10.3.3 dispImages() [2/4]

```
void dispNav::dispImages (
             std::string title,
             cv::Mat & IC,
             ScaleLines linesInLeft,
             cv::Mat & IK,
             ScaleLines linesInRight,
             std::vector< unsigned int > matchResult )
```

dispImages dispaly two images side by side in window with matched line segemnts

Parameters

title	title of window
IC	cv::Mat image
linesInLeft	lines in IC
IK	cv::Mat image
linesInRight	lines in IK
matchResult	matched line indices

Definition at line 296 of file dispnav.cpp.

15.10.3.4 dispImages() [3/4]

```
void dispNav::dispImages (
            std::string title,
            cv::Mat & IP,
            cv::Mat & IC,
            cv::Mat & IN,
            cv::Mat & INN )
```

dispImages display images in 2x2 grid window

Parameters

title	title of window
IP	cv::Mat image
IC	cv::Mat image
IN	cv::Mat image
INN	cv::Mat image

Definition at line 86 of file dispnav.cpp.

15.10.3.5 dispImages() [4/4]

```
void dispNav::dispImages (
            std::string title,
            cv::Mat & IP,
            cv::Mat & IC,
            cv::Mat & IN,
            cv::Mat & INN,
            ScaleLines & cLines,
            ScaleLines & nLines,
            ScaleLines & nnLines,
            std::vector< std::vector< int > > & op )
```

dispImages display images in 2x2 grid window

Parameters

title	title title of window
IP	cv::Mat image
IC	cv::Mat image
IN	cv::Mat image
INN	cv::Mat image
cLines	lines in IC
nLines	lines in IN
nnLines	lines in INN
op	matcjed line indices among IC, IN and INN

Definition at line 153 of file dispnav.cpp.

15.10.3.6 displayimage()

```
void dispNav::displayimage (
            bool flag )
```

displayimage show navigation images

Parameters

flag	0 don't show => must be set o when run inside the Pepper robot

Definition at line 49 of file dispnav.cpp.

15.10.3.7 dispNavigation() [1/2]

```
void dispNav::dispNavigation (
            cv::Mat & Ic )
```

dispNavigation

Parameters

Ic	Current Image

Definition at line 80 of file dispnav.cpp.

15.10.3.8 dispNavigation() [2/2]

```
void dispNav::dispNavigation (
             cv::Mat & Ic,
             ScaleLines & cLines,
             ScaleLines & nLines,
             ScaleLines & nnLines,
             std::vector< std::vector< int > > & op )
```

dispNavigation

Parameters

Ic	Current Image
cLines	lines in current image
nLines	lines in next reference image
nnLines	lines in second next reference image
op	matchedlines index

Definition at line 68 of file dispnav.cpp.

15.10.3.9 saveimage()

```
void dispNav::saveimage (
             bool flag )
```

saveimage show navigation images

Parameters

flag	0 don't save

Definition at line 54 of file dispnav.cpp.

15.10.3.10 setDisptime()

```
void dispNav::setDisptime (
             int delay )
```

setDisptime delay foe dispaly window

Parameters

delay	time in ms

Definition at line 39 of file dispnav.cpp.

15.10.3.11 setKeyImages()

```
void dispNav::setKeyImages (
             std::string pkim,
             std::string nkim,
             std::string nnkim )
```

setKeyImages set current reference images

Parameters

pkim	previous reference image
nkim	next reference image
nnkim	second next reference image

Definition at line 58 of file dispnav.cpp.

15.10.3.12 setpseudocolour()

```
void dispNav::setpseudocolour (
             int maxlines )
```

setpseudocolour gebnerate color for lines segents dispaly

Parameters

maxlines	maximum number of lines

Definition at line 362 of file dispnav.cpp.

15.10.3.13 showfeat()

```
void dispNav::showfeat (
             bool flag )
```

showfeat draw features used for ibvs in displayed image if image is displayed

Parameters

flag	0 don't draw

Definition at line 45 of file dispnav.cpp.

15.10.4 Member Data Documentation

15.10.4.1 size

```
int dispNav::size
```

Definition at line 64 of file dispnav.h.

15.10.4.2 sz

```
int dispNav::sz
```

Definition at line 64 of file dispnav.h.

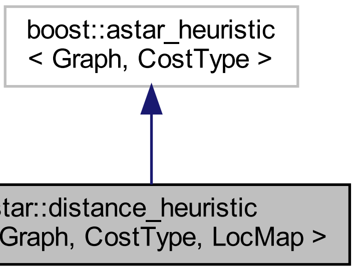
The documentation for this class was generated from the following files:

- linenav/dispnav.h
- linenav/dispnav.cpp

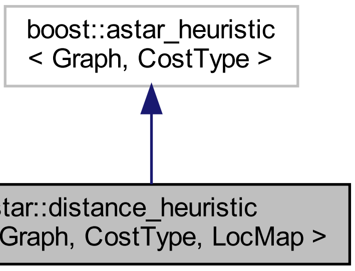
15.11 astar::distance_heuristic< Graph, CostType, LocMap > Class Template Reference

```
#include <topograph_astar.h>
```

Inheritance diagram for astar::distance_heuristic< Graph, CostType, LocMap >:


boost::astar_heuristic < Graph, CostType >
astar::distance_heuristic < Graph, CostType, LocMap >

Collaboration diagram for astar::distance_heuristic< Graph, CostType, LocMap >:


boost::astar_heuristic < Graph, CostType >
astar::distance_heuristic < Graph, CostType, LocMap >

Public Types

- typedef boost::graph_traits< Graph >::vertex_descriptor Vertex

Public Member Functions

- distance_heuristic (LocMap l, Vertex goal)
- CostType operator() (Vertex u)

15.11.1 Detailed Description

template<class Graph, class CostType, class LocMap>
class astar::distance_heuristic< Graph, CostType, LocMap >

Definition at line 88 of file topograph_astar.h.

15.11.2 Member Typedef Documentation

15.11.2.1 Vertex

```
template<class Graph , class CostType , class LocMap >
typedef boost::graph_traits<Graph>::vertex_descriptor astar::distance_heuristic< Graph, CostType,
LocMap >::Vertex
```

Definition at line 91 of file topograph_astar.h.

15.11.3 Constructor & Destructor Documentation

15.11.3.1 distance_heuristic()

```
template<class Graph , class CostType , class LocMap >
astar::distance_heuristic< Graph, CostType, LocMap >::distance_heuristic (
             LocMap l,
             Vertex goal )  [inline]
```

Definition at line 92 of file topograph_astar.h.

15.11.4 Member Function Documentation

15.11.4.1 operator()()

```
template<class Graph , class CostType , class LocMap >
CostType astar::distance_heuristic< Graph, CostType, LocMap >::operator() (
            Vertex u )  [inline]
```

Definition at line 94 of file topograph_astar.h.

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

- navmain/topograph_astar.h

15.12 tgraph::edge Struct Reference

```
#include <topograph_processor.h>
```

Public Attributes

- int sid
- int eid
- std::string fold

15.12.1 Detailed Description

Edges of topological graph sid: start id eid: end id fold : folder where the reference images of the edge lies edges and brances both represent the edge branches are used to simplify imags retrival for ibvs

Definition at line 51 of file topograph_processor.h.

15.12.2 Member Data Documentation

15.12.2.1 eid

```
int tgraph::edge::eid
```

Definition at line 53 of file topograph_processor.h.

15.12.2.2 fold

```
std::string tgraph::edge::fold
```

Definition at line 54 of file topograph_processor.h.

15.12.2.3 sid

```
int tgraph::edge::sid
```

Definition at line 52 of file topograph_processor.h.

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

- navmain/topograph_processor.h

15.13 EdgeChains Struct Reference

```
#include <EDLineDetector.hh>
```

Public Attributes

- std::vector< unsigned int > xCors
- std::vector< unsigned int > yCors
- std::vector< unsigned int > sId
- unsigned int numOfEdges

15.13.1 Detailed Description

Definition at line 58 of file EDLineDetector.hh.

15.13.2 Member Data Documentation

15.13.2.1 numOfEdges

```
unsigned int EdgeChains::numOfEdges
```

Definition at line 62 of file EDLineDetector.hh.

15.13.2.2 sId

```
std::vector<unsigned int> EdgeChains::sId
```

Definition at line 61 of file EDLineDetector.hh.

15.13.2.3 xCors

```
std::vector<unsigned int> EdgeChains::xCors
```

Definition at line 59 of file EDLineDetector.hh.

15.13.2.4 yCors

```
std::vector<unsigned int> EdgeChains::yCors
```

Definition at line 60 of file EDLineDetector.hh.

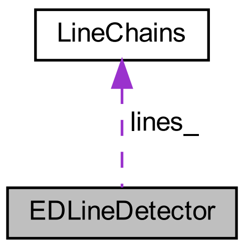
The documentation for this struct was generated from the following file:

- linenav/EDLineDetector.hh

15.14 EDLineDetector Class Reference

```
#include <EDLineDetector.hh>
```

Collaboration diagram for EDLineDetector:



Public Member Functions

- EDLineDetector ()
- EDLineDetector (EDLineParam param)
- ∼EDLineDetector ()
- int EdgeDrawing (cv::Mat &image, EdgeChains &edgeChains, bool smoothed=false)
- int EDline (cv::Mat &image, LineChains &lines, bool smoothed=false)
- int EDline (cv::Mat &image, bool smoothed=false)

Public Attributes

- cv::Mat dxImg_
- cv::Mat dyImg_
- cv::Mat gImgWO_
- LineChains lines_
- std::vector< std::array< double, 3 > > lineEquations_
- std::vector< std::array< float, 4 > > lineEndpoints_
- std::vector< float > lineDirection_
- std::vector< float > lineSalience_
- unsigned int imageWidth
- unsigned int imageHeight

15.14.1 Detailed Description

Definition at line 96 of file EDLineDetector.hh.

15.14.2 Constructor & Destructor Documentation

15.14.2.1 EDLineDetector() [1/2]

```
EDLineDetector::EDLineDetector ( )
```

Definition at line 60 of file EDLineDetector.cpp.

15.14.2.2 EDLineDetector() [2/2]

```
EDLineDetector::EDLineDetector (
            EDLineParam param )
```

Definition at line 73 of file EDLineDetector.cpp.

15.14.2.3 ∼EDLineDetector()

```
EDLineDetector::∼EDLineDetector ( )
```

Definition at line 109 of file EDLineDetector.cpp.

15.14.3 Member Function Documentation

15.14.3.1 EdgeDrawing()

```
int EDLineDetector::EdgeDrawing (
             cv::Mat & image,
             EdgeChains & edgeChains,
             bool smoothed = false )
```

Definition at line 137 of file EDLineDetector.cpp.

15.14.3.2 EDline() [1/2]

```
int EDLineDetector::EDline (
             cv::Mat & image,
             bool smoothed = false )
```

Definition at line 1273 of file EDLineDetector.cpp.

15.14.3.3 EDline() [2/2]

```
int EDLineDetector::EDline (
             cv::Mat & image,
             LineChains & lines,
             bool smoothed = false )
```

Definition at line 811 of file EDLineDetector.cpp.

15.14.4 Member Data Documentation

15.14.4.1 dxImg_

```
cv::Mat EDLineDetector::dxImg_
```

Definition at line 120 of file EDLineDetector.hh.

15.14.4.2 dyImg_

```
cv::Mat EDLineDetector::dyImg_
```

Definition at line 121 of file EDLineDetector.hh.

15.14.4.3 gImgWO_

```
cv::Mat EDLineDetector::gImgWO_
```

Definition at line 122 of file EDLineDetector.hh.

15.14.4.4 imageHeight

```
unsigned int EDLineDetector::imageHeight
```

Definition at line 133 of file EDLineDetector.hh.

15.14.4.5 imageWidth

```
unsigned int EDLineDetector::imageWidth
```

Definition at line 132 of file EDLineDetector.hh.

15.14.4.6 lineDirection_

```
std::vector<float> EDLineDetector::lineDirection_
```

Definition at line 129 of file EDLineDetector.hh.

15.14.4.7 lineEndpoints_

```
std::vector<std::array<float, 4> > EDLineDetector::lineEndpoints_
```

Definition at line 127 of file EDLineDetector.hh.

15.14.4.8 lineEquations_

```
std::vector<std::array<double, 3> > EDLineDetector::lineEquations_
```

Definition at line 125 of file EDLineDetector.hh.

15.14.4.9 lines_

`LineChains EDLineDetector::lines_`

Definition at line 123 of file EDLineDetector.hh.

15.14.4.10 lineSalience_

`std::vector<float> EDLineDetector::lineSalience_`

Definition at line 131 of file EDLineDetector.hh.

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

- linenav/EDLineDetector.hh
- linenav/EDLineDetector.cpp

15.15 EDLineParam Struct Reference

`#include <EDLineDetector.hh>`

Public Attributes

- int ksize
- float sigma
- float gradientThreshold
- float anchorThreshold
- int scanIntervals
- int minLineLen
- double lineFitErrThreshold

15.15.1 Detailed Description

Definition at line 74 of file EDLineDetector.hh.

15.15.2 Member Data Documentation

15.15.2.1 anchorThreshold

`float EDLineParam::anchorThreshold`

Definition at line 78 of file EDLineDetector.hh.

15.15.2.2 gradientThreshold

```
float EDLineParam::gradientThreshold
```

Definition at line 77 of file EDLineDetector.hh.

15.15.2.3 ksize

```
int EDLineParam::ksize
```

Definition at line 75 of file EDLineDetector.hh.

15.15.2.4 lineFitErrThreshold

```
double EDLineParam::lineFitErrThreshold
```

Definition at line 81 of file EDLineDetector.hh.

15.15.2.5 minLineLen

```
int EDLineParam::minLineLen
```

Definition at line 80 of file EDLineDetector.hh.

15.15.2.6 scanIntervals

```
int EDLineParam::scanIntervals
```

Definition at line 79 of file EDLineDetector.hh.

15.15.2.7 sigma

```
float EDLineParam::sigma
```

Definition at line 76 of file EDLineDetector.hh.

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

- linenav/EDLineDetector.hh

15.16 astar::found_goal Struct Reference

```
#include <topograph_astar.h>
```

15.16.1 Detailed Description

Definition at line 127 of file topograph_astar.h.

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

- navmain/topograph_astar.h

15.17 freespacenavigation Class Reference

```
#include <freespacenavigation.h>
```

Public Member Functions

- freespacenavigation (cv::Mat &kd)

  freespacenavigation constructor
- freespacenavigation (cv::Mat &kd, int scan_height)

  freespacenavigation constructor
- void setinitialpose (const std::vector< float > &pose)

  setinitialpose initial odometry reading
- void setcurrentpose (const std::vector< float > &pose)

  setcurrentpose set current odometry reading
- double getvelfreespace (cv::Mat &ld)

  getvelfreespace returns velocity for freespace navigation
- double getH ()

  getH returns weights required for fusion of control
- void setbasevel (double vt)

  setbasevel set base forward velocity. Required for ibvs

15.17.1 Detailed Description

Definition at line 32 of file freespacenavigation.h.

15.17.2 Constructor & Destructor Documentation

15.17.2.1 freespacenavigation() [1/2]

```
freespacenavigation::freespacenavigation (
            cv::Mat & kd )
```

freespacenavigation constructor

Parameters

kd	: instrinsic parmaters of the depth camera

Definition at line 28 of file freespacenavigation.cpp.

15.17.2.2 freespacenavigation() `[2/2]`

```
freespacenavigation::freespacenavigation (
            cv::Mat & kd,
            int scan_height )
```

freespacenavigation constructor

Parameters

kd	: instrinsic parmaters of the depth camera
scan_height	: no of rows from center considered from the depth image for 2d grid map

Definition at line 48 of file freespacenavigation.cpp.

15.17.3 Member Function Documentation

15.17.3.1 getH()

```
double freespacenavigation::getH ( )
```

getH returns weights required for fusion of control

Returns

H

Definition at line 136 of file freespacenavigation.cpp.

15.17.3.2 getvelfreespace()

```
double freespacenavigation::getvelfreespace (
            cv::Mat & Id )
```

getvelfreespace returns velocity for freespace navigation

Parameters

Id	depth image

Returns

rotational velocity

Definition at line 101 of file freespacenavigation.cpp.

15.17.3.3 setbasevel()

```
void freespacenavigation::setbasevel (
            double vt = 0.18 )
```

setbasevel set base forward velocity. Required for ibvs

Parameters

vt	forward velocity

Definition at line 70 of file freespacenavigation.cpp.

15.17.3.4 setcurrentpose()

```
void freespacenavigation::setcurrentpose (
            const std::vector< float > & pose )
```

setcurrentpose set current odometry reading

Parameters

pose	vector consists of odometry value x,y, and theta

Definition at line 81 of file freespacenavigation.cpp.

15.17.3.5 setinitialpose()

```
void freespacenavigation::setinitialpose (
            const std::vector< float > & pose )
```

setinitialpose initial odometry reading

Parameters

pose	vector consists of odometry value x,y, and theta

Definition at line 74 of file freespacenavigation.cpp.

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

- depthnav/freespacenavigation.h
- depthnav/freespacenavigation.cpp

15.18 astar::graph_writer< Name, LocMap > Class Template Reference

```
#include <topograph_astar.h>
```

Public Member Functions

- graph_writer (Name n, LocMap l, float _minx, float _maxx, float _miny, float _maxy, unsigned int _ptx, unsigned int _pty)
- template< class Vertex >
  void operator() (std::ostream &out, const Vertex &v) const

15.18.1 Detailed Description

template< class Name, class LocMap>
class astar::graph_writer< Name, LocMap >

Definition at line 53 of file topograph_astar.h.

15.18.2 Constructor & Destructor Documentation

15.18.2.1 graph_writer()

```
template<class Name , class LocMap >
astar::graph_writer< Name, LocMap >::graph_writer (
            Name n,
            LocMap l,
            float _minx,
            float _maxx,
            float _miny,
            float _maxy,
            unsigned int _ptx,
            unsigned int _pty )  [inline]
```

Definition at line 55 of file topograph_astar.h.

15.18.3 Member Function Documentation

15.18.3.1 operator()()

```
template<class Name , class LocMap >
template<class Vertex >
void astar::graph_writer< Name, LocMap >::operator() (
             std::ostream & out,
             const Vertex & v ) const  [inline]
```

Definition at line 59 of file topograph_astar.h.

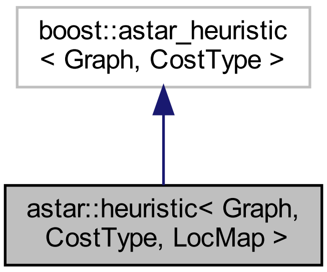
The documentation for this class was generated from the following file:

- navmain/topograph_astar.h

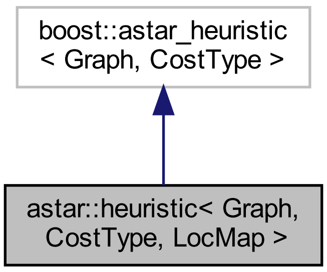
15.19 astar::heuristic< Graph, CostType, LocMap > Class Template Reference

```
#include <topograph_astar.h>
```

Inheritance diagram for astar::heuristic< Graph, CostType, LocMap >:



Collaboration diagram for astar::heuristic< Graph, CostType, LocMap >:



Public Types

- typedef boost::graph_traits< Graph >::vertex_descriptor Vertex

Public Member Functions

- heuristic (LocMap l, Vertex goal)
- CostType operator() (Vertex u)

15.19.1 Detailed Description

template<class Graph, class CostType, class LocMap>
class astar::heuristic< Graph, CostType, LocMap >

Definition at line 107 of file topograph_astar.h.

15.19.2 Member Typedef Documentation

15.19.2.1 Vertex

```
template<class Graph , class CostType , class LocMap >
typedef boost::graph_traits<Graph>::vertex_descriptor astar::heuristic< Graph, CostType, LocMap >↩
::Vertex
```

Definition at line 110 of file topograph_astar.h.

15.19.3 Constructor & Destructor Documentation

15.19.3.1 heuristic()

```
template<class Graph , class CostType , class LocMap >
astar::heuristic< Graph, CostType, LocMap >::heuristic (
             LocMap l,
             Vertex goal )  [inline]
```

Definition at line 111 of file topograph_astar.h.

15.19.4 Member Function Documentation

15.19.4.1 operator()()

```
template<class Graph , class CostType , class LocMap >
CostType astar::heuristic< Graph, CostType, LocMap >::operator() (
            Vertex u ) [inline]
```

Definition at line 113 of file topograph_astar.h.

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

- navmain/topograph_astar.h

15.20 kimRead Class Reference

```
#include <kimread.h>
```

Public Member Functions

- kimRead ()

  kimRead
- kimRead (char ∗kimf)

  kimRead
- kimRead (std::string &kimf)

  kimRead Read reference images
- kimRead (std::string &kimf, int loc)

  kimRead Read reference images
- kimRead (std::string &kimf, int sloc, int eloc)

  kimRead Read reference images
- void setnodes (int sn, int en)

  setnodes
- void setKimbasefold (std::string &fold)

  setKimbasefold
- void resetIndex ()

  resetIndex
- void setKeyImageIndex (int n)

  setKeyImageIndex
- int getStartIndex ()

  getStartIndex
- void setCurrIndex (int indx)

  setCurrIndex
- void getnextKeyImage (std::string &kim)

  getnextKeyImage
- void getnextKeyImage (std::string &kim, std::string &kil)

  getnextKeyImage
- void resetCurrentIndex ()

  resetCurrentIndex
- int currindex ()

  currindex
- int kimsize ()

  kimsize
- int isLast ()

isLast
- void addKeyImages (kimRead ∗kfptr, int stindx, int endindx)

  addKeyImages add reference images to the current list
- void removeBKeyImages (int idx)

  removeBKeyImages remove reference image from the back of the list upto
- void insetKeyImage (std::string &kim, std::string &kil)

  insetKeyImage
- void removeKeyImages (int idx)

  removeKeyImages
- void insertKeyImages (kimRead ∗kfptr, int desloc, int indx)

  insertKeyImages
- void insertKeyImages (kimRead ∗kfptr, int indx)

  insertKeyImages
- void insertKeyImages (kimRead ∗kfptr)

  insertKeyImages instert reference image list
- void getkimfold (std::string &kif)

  getkimfold get referene image folder
- void showkim ()

  showkim display key images
- ∼kimRead ()

15.20.1 Detailed Description

Definition at line 30 of file kimread.h.

15.20.2 Constructor & Destructor Documentation

15.20.2.1 kimRead() [1/5]

```
kimRead::kimRead ( )
```

kimRead

Definition at line 23 of file kimread.cpp.

15.20.2.2 kimRead() [2/5]

```
kimRead::kimRead (
            char ∗ kimf )
```

kimRead

Parameters

kimf	folder containing reference images

Definition at line 40 of file kimread.cpp.

15.20.2.3 kimRead() [3/5]

```
kimRead::kimRead (
             std::string & kimf )
```

kimRead Read reference images

Parameters

kimf	folder containing reference images

Definition at line 86 of file kimread.cpp.

15.20.2.4 kimRead() [4/5]

```
kimRead::kimRead (
             std::string & kimf,
             int loc )
```

kimRead Read reference images

Parameters

kimf	folder containing reference images
loc	start index to insert

Definition at line 132 of file kimread.cpp.

15.20.2.5 kimRead() [5/5]

```
kimRead::kimRead (
             std::string & kimf,
             int sloc,
             int eloc )
```

kimRead Read reference images

Parameters

kimf	folder containing reference images
sloc	start index
eloc	end index

Definition at line 156 of file kimread.cpp.

15.20.2.6 ∼kimRead()

```
kimRead::∼kimRead ( )
```

Definition at line 375 of file kimread.cpp.

15.20.3 Member Function Documentation

15.20.3.1 addKeyImages()

```
void kimRead::addKeyImages (
             kimRead * kfptr,
             int stindx,
             int endindx )
```

addKeyImages add reference images to the current list

Parameters

kfptr	pointer of the reference image list
stindx	start index
endindx	end index

Definition at line 304 of file kimread.cpp.

15.20.3.2 currindex()

```
int kimRead::currindex ( )
```

currindex

Returns

current index

Definition at line 230 of file kimread.cpp.

15.20.3.3 getkimfold()

```
void kimRead::getkimfold (
             std::string & kif )
```

getkimfold get referene image folder

Parameters

kif	path

Definition at line 260 of file kimread.cpp.

15.20.3.4 getnextKeyImage() [1/2]

```
void kimRead::getnextKeyImage (
             std::string & kim )
```

getnextKeyImage

Parameters

kim	read next reference image name

Definition at line 200 of file kimread.cpp.

15.20.3.5 getnextKeyImage() [2/2]

```
void kimRead::getnextKeyImage (
             std::string & kim,
             std::string & kil )
```

getnextKeyImage

Parameters

kim	next reference image name
kil	file conatining line segment of the corresponding reference image

Definition at line 207 of file kimread.cpp.

15.20.3.6 getStartIndex()

```
int kimRead::getStartIndex ( )
```

getStartIndex

Returns

Definition at line 219 of file kimread.cpp.

15.20.3.7 insertKeyImages() [1/3]

```
void kimRead::insertKeyImages (
            kimRead * kfptr )
```

insertKeyImages instert reference image list

Parameters

kfptr	pointer to the reference image list that is to be inserted

Definition at line 350 of file kimread.cpp.

15.20.3.8 insertKeyImages() [2/3]

```
void kimRead::insertKeyImages (
            kimRead * kfptr,
            int desloc,
            int indx )
```

insertKeyImages

Parameters

kfptr	pointer to reference image list
desloc	
indx	

Definition at line 287 of file kimread.cpp.

15.20.3.9 insertKeyImages() [3/3]

```
void kimRead::insertKeyImages (
            kimRead * kfptr,
            int indx )
```

insertKeyImages

Parameters

kfptr	
indx	

Definition at line 325 of file kimread.cpp.

15.20.3.10 insetKeyImage()

```
void kimRead::insetKeyImage (
             std::string & kim,
             std::string & kil )
```

insetKeyImage

Parameters

kim	r
kil	

Definition at line 254 of file kimread.cpp.

15.20.3.11 isLast()

```
int kimRead::isLast ( )
```

isLast

Returns

true if the index is at the end of the list

Definition at line 246 of file kimread.cpp.

15.20.3.12 kimsize()

```
int kimRead::kimsize ( )
```

kimsize

Returns

Definition at line 240 of file kimread.cpp.

15.20.3.13 removeBKeyImages()

```
void kimRead::removeBKeyImages (
             int idx )
```

removeBKeyImages remove reference image from the back of the list upto

Parameters

idx	index

Definition at line 275 of file kimread.cpp.

15.20.3.14 removeKeyImages()

```
void kimRead::removeKeyImages (
             int idx )
```

removeKeyImages

Parameters

idx	

Definition at line 265 of file kimread.cpp.

15.20.3.15 resetCurrentIndex()

```
void kimRead::resetCurrentIndex ( )
```

resetCurrentIndex

Definition at line 235 of file kimread.cpp.

15.20.3.16 resetIndex()

```
void kimRead::resetIndex ( )
```

resetIndex

Definition at line 185 of file kimread.cpp.

15.20.3.17 setCurrIndex()

```
void kimRead::setCurrIndex (
             int indx )
```

setCurrIndex

Parameters

indx	current index

Definition at line 224 of file kimread.cpp.

15.20.3.18 setKeyImageIndex()

```
void kimRead::setKeyImageIndex (
             int n )
```

setKeyImageIndex

Parameters

n	index

Definition at line 191 of file kimread.cpp.

15.20.3.19 setKimbasefold()

```
void kimRead::setKimbasefold (
             std::string & fold )
```

setKimbasefold

Parameters

fold	folder location

Definition at line 35 of file kimread.cpp.

15.20.3.20 setnodes()

```
void kimRead::setnodes (
             int sn,
             int en )
```

setnodes

Parameters

sn	start node
en	end node

Definition at line 81 of file kimread.cpp.

15.20.3.21 showkim()

```
void kimRead::showkim ( )
```

showkim display key images

Definition at line 366 of file kimread.cpp.

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

- linenav/kimread.h
- linenav/kimread.cpp

15.21 LineChains Struct Reference

```
#include <EDLineDetector.hh>
```

Public Attributes

- std::vector< unsigned int > xCors
- std::vector< unsigned int > yCors
- std::vector< unsigned int > sId
- unsigned int numOfLines

15.21.1 Detailed Description

Definition at line 64 of file EDLineDetector.hh.

15.21.2 Member Data Documentation

15.21.2.1 numOfLines

```
unsigned int LineChains::numOfLines
```

Definition at line 68 of file EDLineDetector.hh.

15.21.2.2 sId

```
std::vector<unsigned int> LineChains::sId
```

Definition at line 67 of file EDLineDetector.hh.

15.21.2.3 xCors

```
std::vector<unsigned int> LineChains::xCors
```

Definition at line 65 of file EDLineDetector.hh.

15.21.2.4 yCors

```
std::vector<unsigned int> LineChains::yCors
```

Definition at line 66 of file EDLineDetector.hh.

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

- linenav/EDLineDetector.hh

15.22 LineDescriptor Class Reference

```
#include <LineDescriptor.hh>
```

Public Types

- enum { NearestNeighbor =0, NNDR =1 }

Public Member Functions

- LineDescriptor ()
- LineDescriptor (unsigned int numOfBand, unsigned int widthOfBand)
- ∼LineDescriptor ()
- int GetLineDescriptor (cv::Mat &image, ScaleLines &keyLines)
- int OctaveKeyLines (cv::Mat &image, ScaleLines &keyLines)
- void findLineDesc (ScaleLines &keyLines)
- void computeBinaryLineDesc (ScaleLines &keyLines)
- int MatchLineByDescriptor (ScaleLines &keyLinesLeft, ScaleLines &keyLinesRight, std::vector< short > &matchLeft, std::vector< short > &matchRight, int criteria=NNDR)
- int LineMatchingBinary (ScaleLines &keyLinesLeft, ScaleLines &keyLinesRight, std::vector< unsigned int > &match↩ Result)

Public Attributes

- float LowestThreshold
- float NNDRThreshold
- int bDistThreshold

15.22.1 Detailed Description

Definition at line 28 of file LineDescriptor.hh.

15.22.2 Member Enumeration Documentation

15.22.2.1 anonymous enum

```
anonymous enum
```

Enumerator

NearestNeighbor	
NNDR	

Definition at line 34 of file LineDescriptor.hh.

15.22.3 Constructor & Destructor Documentation

15.22.3.1 LineDescriptor() [1/2]

```
LineDescriptor::LineDescriptor ( )
```

Definition at line 23 of file LineDescriptor.cpp.

15.22.3.2 LineDescriptor() [2/2]

```
LineDescriptor::LineDescriptor (
            unsigned int numOfBand,
            unsigned int widthOfBand )
```

Definition at line 61 of file LineDescriptor.cpp.

15.22.3.3 ∼LineDescriptor()

```
LineDescriptor::~LineDescriptor ( )
```

Definition at line 98 of file LineDescriptor.cpp.

15.22.4 Member Function Documentation

15.22.4.1 computeBinaryLineDesc()

```
void LineDescriptor::computeBinaryLineDesc (
             ScaleLines & keyLines )
```

Definition at line 1287 of file LineDescriptor.cpp.

15.22.4.2 findLineDesc()

```
void LineDescriptor::findLineDesc (
             ScaleLines & keyLines )
```

Definition at line 1140 of file LineDescriptor.cpp.

15.22.4.3 GetLineDescriptor()

```
int LineDescriptor::GetLineDescriptor (
             cv::Mat & image,
             ScaleLines & keyLines )
```

Definition at line 1170 of file LineDescriptor.cpp.

15.22.4.4 LineMatchingBinary()

```
int LineDescriptor::LineMatchingBinary (
             ScaleLines & keyLinesLeft,
             ScaleLines & keyLinesRight,
             std::vector< unsigned int > & matchResult )
```

Definition at line 1331 of file LineDescriptor.cpp.

15.22.4.5 MatchLineByDescriptor()

```
int LineDescriptor::MatchLineByDescriptor (
            ScaleLines & keyLinesLeft,
            ScaleLines & keyLinesRight,
            std::vector< short > & matchLeft,
            std::vector< short > & matchRight,
            int criteria = NNDR )
```

Definition at line 1200 of file LineDescriptor.cpp.

15.22.4.6 OctaveKeyLines()

```
int LineDescriptor::OctaveKeyLines (
            cv::Mat & image,
            ScaleLines & keyLines )
```

Definition at line 484 of file LineDescriptor.cpp.

15.22.5 Member Data Documentation

15.22.5.1 bDistThreshold

```
int LineDescriptor::bDistThreshold
```

Definition at line 53 of file LineDescriptor.hh.

15.22.5.2 LowestThreshold

```
float LineDescriptor::LowestThreshold
```

Definition at line 51 of file LineDescriptor.hh.

15.22.5.3 NNDRThreshold

```
float LineDescriptor::NNDRThreshold
```

Definition at line 52 of file LineDescriptor.hh.

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

- linenav/LineDescriptor.hh
- linenav/LineDescriptor.cpp

15.23 linematch Class Reference

```
#include <linematch.h>
```

Public Member Functions

- linematch ()

  linematch
- void readlinedesc (std::string keyIn, ScaleLines &linesInRight)

  readlinedesc read line descriptors from file
- void matchlines (ScaleLines &linesInLeft, ScaleLines &linesInRight, std::vector< unsigned int > &matchResult)

  matchlines matches lines based on LBD descriptors
- void matchlinesbinary (ScaleLines &linesInLeft, ScaleLines &linesInRight, std::vector< unsigned int > &matchResult)

  matchlinesbinary matches lines based on binary descriptors
- void findCommonIndex (std::vector< unsigned int > v1, std::vector< unsigned int > v2, std::vector< std::vector< int > > &op)

  findCommonIndex find common index => for 3 view line matching between im1, im2 and im3
- void findCommonIndex2 (std::vector< unsigned int > v1, std::vector< unsigned int > v2, std::vector< std::vector< int > > &op)
- int getlinedesc (cv::Mat &leftImage, ScaleLines &linesInLeft)

  getlinedesc calulae line descriptos

15.23.1 Detailed Description

Definition at line 28 of file linematch.h.

15.23.2 Constructor & Destructor Documentation

15.23.2.1 linematch()

```
linematch::linematch ( )
```

linematch

Definition at line 23 of file linematch.cpp.

15.23.3 Member Function Documentation

15.23.3.1 findCommonIndex()

```
void linematch::findCommonIndex (
            std::vector< unsigned int > v1,
            std::vector< unsigned int > v2,
            std::vector< std::vector< int > > & op )
```

findCommonIndex find common index => for 3 view line matching between im1, im2 and im3

Parameters

v1	match pair between im1 im2
v2	match pair between im1 and im3
op	matched index

Definition at line 153 of file linematch.cpp.

15.23.3.2 findCommonIndex2()

```
void linematch::findCommonIndex2 (
            std::vector< unsigned int > v1,
            std::vector< unsigned int > v2,
            std::vector< std::vector< int > > & op )
```

Definition at line 183 of file linematch.cpp.

15.23.3.3 getlinedesc()

```
int linematch::getlinedesc (
            cv::Mat & leftImage,
            ScaleLines & linesInLeft )
```

getlinedesc calulae line descriptos

Parameters

leftImage	image
linesInLeft	line descriptors

Returns

Definition at line 42 of file linematch.cpp.

15.23.3.4 matchlines()

```
void linematch::matchlines (
            ScaleLines & linesInLeft,
            ScaleLines & linesInRight,
            std::vector< unsigned int > & matchResult )
```

matchlines matches lines based on LBD descriptors

Parameters

linesInLeft	
linesInRight	
matchResult	index of matched pairs

Definition at line 142 of file linematch.cpp.

15.23.3.5 matchlinesbinary()

```
void linematch::matchlinesbinary (
             ScaleLines & linesInLeft,
             ScaleLines & linesInRight,
             std::vector< unsigned int > & matchResult )
```

matchlinesbinary matches lines based on binary descriptors

Parameters

linesInLeft	
linesInRight	
matchResult	

Definition at line 147 of file linematch.cpp.

15.23.3.6 readlinedesc()

```
void linematch::readlinedesc (
             std::string keyIn,
             ScaleLines & linesInRight )
```

readlinedesc read line descriptors from file

Parameters

keyIn	file containing line segemts and descriptors
linesInRight	line segemnts and descriptors in ScaleLine format

Definition at line 84 of file linematch.cpp.

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

- linenav/linematch.h
- linenav/linematch.cpp

15.24 linenavigation Class Reference

```
#include <linenavigation.h>
```

Public Member Functions

- linenavigation (dispNav ∗d, cv::Mat &Kc)

  linenavigation
- linenavigation ()
- void setDisplay (dispNav ∗d)

  setDisplay
- void setK (cv::Mat &Kc)

  setK
- int initlocalisation (cv::Mat &Ic, kimRead &kf)

  initlocalisation perform global localiztion in the reference image list
- void initiallocalisationLines (cv::Mat &Ic, kimRead &kf, int &idx, int &nml)

  initlocalisation perform global localiztion in the reference image list
- void SetKeyImages (std::string pim, std::string nim, std::string nnim)

  SetKeyImages set current reference images.
- void SwitchKeyImages (std::string nnim)

  SwitchKeyImages Switch reference images.
- int SwitchtoNewKeyImages (kimRead &kf)

  SwitchtoNewKeyImages switch reference images.
- int step (cv::Mat &Ic)

  step perform succesive localiztion
- int initiallocalisationLines (cv::Mat &Ic, kimRead &kf)

  initlocalisation perform global localiztion in the reference image list
- int setInitialKeyImages (cv::Mat &Ic, kimRead &kf, int index)

  setInitialKeyImages set inital set of reference images
- double getRotVel ()

  getRotVel calucluate rotational velocity 3 view version
- double getRotVel2 ()

  getRotVel2 calucluate rotational velocity 2 view version
- double getRotVel (std::vector< double > &err, std::vector< double > &jac)

  getRotVel calucluate rotational velocity 3 view version
- double getRotVel2 (std::vector< double > &err, std::vector< double > &jac)

  getRotVel2 calucluate rotational velocity 2 view version
- double getdiffN2NN ()

  getdiffN2NN

Public Attributes

- int linesno
- int linesnoN
- int linesnoNN

Protected Attributes

- std::string previmg
- std::string nextimg
- std::string nextnextimg

15.24.1 Detailed Description

Definition at line 31 of file linenavigation.h.

15.24.2 Constructor & Destructor Documentation

15.24.2.1 linenavigation() [1/2]

```
linenavigation::linenavigation (
            dispNav * d,
            cv::Mat & Kc )
```

linenavigation

Parameters

d	pointer to display
Kc	intrinsic matrix of RGB camera

Definition at line 49 of file linenavigation.cpp.

15.24.2.2 linenavigation() [2/2]

```
linenavigation::linenavigation ( )
```

Definition at line 24 of file linenavigation.cpp.

15.24.3 Member Function Documentation

15.24.3.1 getdiffN2NN()

```
double linenavigation::getdiffN2NN ( )
```

getdiffN2NN

Returns

lateral displacement beween reference images

Definition at line 117 of file linenavigation.cpp.

15.24.3.2 getRotVel() [1/2]

```
double linenavigation::getRotVel ( )
```

getRotVel calucluate rotational velocity 3 view version

Returns

rotational velocity

Definition at line 595 of file linenavigation.cpp.

15.24.3.3 getRotVel() [2/2]

```
double linenavigation::getRotVel (
            std::vector< double > & err,
            std::vector< double > & jac )
```

getRotVel calucluate rotational velocity 3 view version

Parameters

err	error
jac	jacobian

Returns

rotational velocity

Definition at line 787 of file linenavigation.cpp.

15.24.3.4 getRotVel2() [1/2]

```
double linenavigation::getRotVel2 ( )
```

getRotVel2 calucluate rotational velocity 2 view version

Returns

rotational velocity

Definition at line 625 of file linenavigation.cpp.

15.24.3.5 getRotVel2() [2/2]

```
double linenavigation::getRotVel2 (
            std::vector< double > & err,
            std::vector< double > & jac )
```

getRotVel2 calucluate rotational velocity 2 view version

Parameters

err	error
jac	jacobian

Returns

rotational velocity

Definition at line 828 of file linenavigation.cpp.

15.24.3.6 initiallocalisationLines() [1/2]

```
int linenavigation::initiallocalisationLines (
            cv::Mat & Ic,
            kimRead & kf )
```

initlocalisation perform global localiztion in the reference image list

Parameters

Ic	current image
kf	reference image list

Definition at line 286 of file linenavigation.cpp.

15.24.3.7 initiallocalisationLines() [2/2]

```
void linenavigation::initiallocalisationLines (
            cv::Mat & Ic,
            kimRead & kf,
            int & idx,
            int & nml )
```

initlocalisation perform global localiztion in the reference image list

Parameters

Ic	current image
kf	reference image list
idx	index of the refernce image in the list that matches best with current image
nlm	maximum number of matched lines

Definition at line 356 of file linenavigation.cpp.

15.24.3.8 initlocalisation()

```
int linenavigation::initlocalisation (
             cv::Mat & Ic,
             kimRead & kf )
```

initlocalisation perform global localiztion in the reference image list

Parameters

Ic	current image
kf	reference image list

Definition at line 176 of file linenavigation.cpp.

15.24.3.9 setDisplay()

```
void linenavigation::setDisplay (
             dispNav * d )
```

setDisplay

Parameters

d	pointer to display

Definition at line 37 of file linenavigation.cpp.

15.24.3.10 setInitialKeyImages()

```
int linenavigation::setInitialKeyImages (
             cv::Mat & Ic,
             kimRead & kf,
             int index )
```

setInitialKeyImages set inital set of reference images

Parameters

Ic	curr image
kf	reference image list
index	index in the list

Returns

Definition at line 437 of file linenavigation.cpp.

15.24.3.11 setK()

```
void linenavigation::setK (
             cv::Mat & Kc )
```

setK

Parameters

Kc	intrinsic matrix of RGB camera

Definition at line 41 of file linenavigation.cpp.

15.24.3.12 SetKeyImages()

```
void linenavigation::SetKeyImages (
             std::string pim,
             std::string nim,
             std::string nnim )
```

SetKeyImages set current reference images.

Parameters

pim	path of previous reference image
nim	path of next reference image
nnim	path of second-next reference image

Definition at line 64 of file linenavigation.cpp.

15.24.3.13 step()

```
int linenavigation::step (
             cv::Mat & Ic )
```

step perform succesive localiztion

Parameters

Ic	current image

Returns

1 if reference images need to be switched 0 continue $<$0 = expections in linedetection/ matching

Definition at line 121 of file linenavigation.cpp.

15.24.3.14 SwitchKeyImages()

```
void linenavigation::SwitchKeyImages (
             std::string nnim )
```

SwitchKeyImages Switch reference images.

Parameters

nnim	path of second-next reference image

Definition at line 75 of file linenavigation.cpp.

15.24.3.15 SwitchtoNewKeyImages()

```
int linenavigation::SwitchtoNewKeyImages (
             kimRead & kf )
```

SwitchtoNewKeyImages switch reference images.

Parameters

kf	

Returns

1 for end of topological navigation

Definition at line 84 of file linenavigation.cpp.

15.24.4 Member Data Documentation

15.24.4.1 linesno

```
int linenavigation::linesno
```

Definition at line 191 of file linenavigation.h.

15.24.4.2 linesnoN

```
int linenavigation::linesnoN
```

Definition at line 192 of file linenavigation.h.

15.24.4.3 linesnoNN

```
int linenavigation::linesnoNN
```

Definition at line 193 of file linenavigation.h.

15.24.4.4 nextimg

```
std::string linenavigation::nextimg  [protected]
```

Definition at line 76 of file linenavigation.h.

15.24.4.5 nextnextimg

```
std::string linenavigation::nextnextimg  [protected]
```

Definition at line 76 of file linenavigation.h.

15.24.4.6 previmg

```
std::string linenavigation::previmg  [protected]
```

Definition at line 76 of file linenavigation.h.

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

- linenav/linenavigation.h
- linenav/linenavigation.cpp

15.25 astar::location Struct Reference

```
#include <topograph_astar.h>
```

Public Attributes

- float y
- float x

15.25.1 Detailed Description

Definition at line 46 of file topograph_astar.h.

15.25.2 Member Data Documentation

15.25.2.1 x

```
float astar::location::x
```

Definition at line 48 of file topograph_astar.h.

15.25.2.2 y

```
float astar::location::y
```

Definition at line 48 of file topograph_astar.h.

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

- navmain/topograph_astar.h

15.26 Matrix< T > Class Template Reference

```
#include <PairwiseLineMatching.hh>
```

Public Member Functions

- Matrix (unsigned int r, unsigned int c)
- T ∗& operator[ ] (const int &index) const
- void SetZero ()
- ∼Matrix ()

15.26.1 Detailed Description

template<class T>
class Matrix< T >

Definition at line 38 of file PairwiseLineMatching.hh.

15.26.2 Constructor & Destructor Documentation

15.26.2.1 Matrix()

```
template<class T >
Matrix< T >::Matrix (
            unsigned int r,
            unsigned int c )  [inline]
```

Definition at line 44 of file PairwiseLineMatching.hh.

15.26.2.2 ∼Matrix()

```
template<class T >
Matrix< T >::∼Matrix ( )  [inline]
```

Definition at line 62 of file PairwiseLineMatching.hh.

15.26.3 Member Function Documentation

15.26.3.1 operator[]()

```
template<class T >
T* & Matrix< T >::operator[] (
            const int & index ) const  [inline]
```

Definition at line 52 of file PairwiseLineMatching.hh.

15.26.3.2 SetZero()

```
template<class T >
void Matrix< T >::SetZero ( )  [inline]
```

Definition at line 56 of file PairwiseLineMatching.hh.

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

- linenav/PairwiseLineMatching.hh

15.27 MyService Class Reference

Public Member Functions

- MyService (qi::AnyObject &almemory)
- void myCallback (const std::string &key, const qi::AnyValue &value, const qi::AnyValue &message)
- void myCallback2 (const std::string &key, const qi::AnyValue &value, const qi::AnyValue &message)
- void myCallback1 (const std::string &key, const qi::AnyValue &value, const qi::AnyValue &message)

15.27.1 Detailed Description

Definition at line 27 of file depthnav_Pepper.cpp.

15.27.2 Constructor & Destructor Documentation

15.27.2.1 MyService()

```
MyService::MyService (
             qi::AnyObject & almemory )  [inline]
```

Definition at line 32 of file depthnav_Pepper.cpp.

15.27.3 Member Function Documentation

15.27.3.1 myCallback()

```
void MyService::myCallback (
             const std::string & key,
             const qi::AnyValue & value,
             const qi::AnyValue & message )  [inline]
```

Definition at line 49 of file depthnav_Pepper.cpp.

15.27.3.2 myCallback1()

```
void MyService::myCallback1 (
             const std::string & key,
             const qi::AnyValue & value,
             const qi::AnyValue & message )  [inline]
```

Definition at line 95 of file depthnav_Pepper.cpp.

15.27.3.3 myCallback2()

```
void MyService::myCallback2 (
            const std::string & key,
            const qi::AnyValue & value,
            const qi::AnyValue & message )  [inline]
```

Definition at line 65 of file depthnav_Pepper.cpp.

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

- depthnav/depthnav_Pepper.cpp

15.28 navigation Class Reference

The navigation class.

`#include <navigation.h>`

Public Member Functions

- navigation (dispNav ∗d, cv::Mat &Kc)

  navigation
- void initlocalisation (cv::Mat &Ic, kimRead &kf)

  initlocalisation perform global localiztion in the reference image list
- void initlocalisation (cv::Mat &Ic, kimRead &kf, int &idx, int &nlm)

  initlocalisation perform global localiztion in the reference image list
- int step (cv::Mat &Ic)

  step perform succesive localiztion
- int SwitchtoNewKeyImages (kimRead &kf)

  SwitchtoNewKeyImages switch reference images.
- double getRotVel ()

  getRotVel calulate rotational velocity based on ibvs
- double getturninginkim ()

  getturninginkim
- double getinitdisp ()

  getinitdisp getinitdisplacemt get lateral displacement with refernce images
- void usecollisionavoidance (bool flag)

  usecollisionavoidance set collisionavoidance flag
- bool usecollisionavoidance ()

  usecollisionavoidance

Public Attributes

- ofstream velfile
- ofstream featfile
- ofstream jacfile
- ofstream errfile

15.28.1 Detailed Description

The navigation class.

Definition at line 38 of file navigation.h.

15.28.2 Constructor & Destructor Documentation

15.28.2.1 navigation()

```
navigation::navigation (
            dispNav * d,
            cv::Mat & Kc )
```

navigation

Parameters

d	pointer to display
Kc	intrinsic matrix of RGB camera

Definition at line 25 of file navigation.cpp.

15.28.3 Member Function Documentation

15.28.3.1 getinitdisp()

```
double navigation::getinitdisp ( )
```

getinitdisp getinitdisplacemt get lateral displacement with refernce images

Returns

dispalcement

Definition at line 116 of file navigation.cpp.

15.28.3.2 getRotVel()

```
double navigation::getRotVel ( )
```

getRotVel calulate rotational velocity based on ibvs

Returns

rotational velocity

Definition at line 87 of file navigation.cpp.

15.28.3.3 getturninginkim()

```
double navigation::getturninginkim ( )
```

getturninginkim

Returns

turnval

Definition at line 123 of file navigation.cpp.

15.28.3.4 initlocalisation() [1/2]

```
void navigation::initlocalisation (
            cv::Mat & Ic,
            kimRead & kf )
```

initlocalisation perform global localiztion in the reference image list

Parameters

Ic	current image
kf	reference image list

Definition at line 63 of file navigation.cpp.

15.28.3.5 initlocalisation() [2/2]

```
void navigation::initlocalisation (
            cv::Mat & Ic,
            kimRead & kf,
            int & idx,
            int & nlm )
```

initlocalisation perform global localiztion in the reference image list

Parameters

Ic	current image
kf	reference image list
idx	index of the refernce image in the list that matches best with current image
nlm	maximum number of matched lines

Definition at line 70 of file navigation.cpp.

15.28.3.6 step()

```
int navigation::step (
            cv::Mat & Ic )
```

step perform succesive localiztion

Parameters

Ic	current image

Returns

1 if reference images need to be switched 0 continue <0 = expections in linedetection/ matching

Definition at line 76 of file navigation.cpp.

15.28.3.7 SwitchtoNewKeyImages()

```
int navigation::SwitchtoNewKeyImages (
            kimRead & kf )
```

SwitchtoNewKeyImages switch reference images.

Parameters

kf	

Returns

1 for end of topological navigation

Definition at line 82 of file navigation.cpp.

15.28.3.8 usecollisionavoidance() [1/2]

```
bool navigation::usecollisionavoidance ( )
```

usecollisionavoidance

Returns

0 if collision avoidance is not used 1 if used

Definition at line 59 of file navigation.cpp.

15.28.3.9 usecollisionavoidance() [2/2]

```
void navigation::usecollisionavoidance (
            bool flag )
```

usecollisionavoidance set collisionavoidance flag

Parameters

flag	0=> don't use , 1 =>use

Definition at line 55 of file navigation.cpp.

15.28.4 Member Data Documentation

15.28.4.1 errfile

```
ofstream navigation::errfile
```

Definition at line 67 of file navigation.h.

15.28.4.2 featfile

```
ofstream navigation::featfile
```

Definition at line 67 of file navigation.h.

15.28.4.3 jacfile

```
ofstream navigation::jacfile
```

Definition at line 67 of file navigation.h.

15.28.4.4 velfile

```
ofstream navigation::velfile
```

Definition at line 67 of file navigation.h.

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

- navmain/navigation.h
- navmain/navigation.cpp

15.29 NavInside Class Reference

```
#include <navinside.h>
```

Public Member Functions

- NavInside ()

  NavInside::NavInside.
- ∼NavInside ()
- void setPointers (astar::astar &as, tgraph::topmapprocessor &TP)

  setPointers set pointers rekared to graph processing and searching
- void setPepperRobotPointer (pepperInterface ∗pr, dispNav ∗d)

  setPepperRobotPointer
- void setKimfoldoffline (std::string kif)

  setKimfoldoffline
- void startRobotNavigation ()
- void setGraph (int N, astar::node ∗node_array, int num_edges, astar::edge ∗edge_array, astar::cost ∗wts)

15.29.1 Detailed Description

Definition at line 30 of file navinside.h.

15.29.2 Constructor & Destructor Documentation

15.29.2.1 NavInside()

```
NavInside::NavInside ( )
```

NavInside::NavInside.

Parameters

parent	

Definition at line 29 of file navinside.cpp.

15.29.2.2 ∼NavInside()

```
NavInside::∼NavInside ( )
```

Definition at line 52 of file navinside.cpp.

15.29.3 Member Function Documentation

15.29.3.1 setGraph()

```
void NavInside::setGraph (
            int N,
            astar::node * node_array,
            int num_edges,
            astar::edge * edge_array,
            astar::cost * wts )
```

Definition at line 57 of file navinside.cpp.

15.29.3.2 setKimfoldoffline()

```
void NavInside::setKimfoldoffline (
            std::string kif )
```

setKimfoldoffline

Parameters

kif	

Definition at line 564 of file navinside.cpp.

15.29.3.3 setPepperRobotPointer()

```
void NavInside::setPepperRobotPointer (
            pepperInterface * pr,
            dispNav * d )
```

setPepperRobotPointer

Parameters

pr	

Definition at line 190 of file navinside.cpp.

15.29.3.4 setPointers()

```
void NavInside::setPointers (
            astar::astar & as,
            tgraph::topmapprocessor & TP )
```

setPointers set pointers rekared to graph processing and searching

Parameters

as	Pointer to astar search
TP	Pointer to topological garph processor

Definition at line 179 of file navinside.cpp.

15.29.3.5 startRobotNavigation()

```
void NavInside::startRobotNavigation ( )
```

Definition at line 232 of file navinside.cpp.

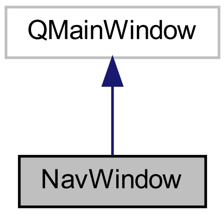
The documentation for this class was generated from the following files:

- navmain/maingui/navinside.h
- navmain/maingui/navinside.cpp

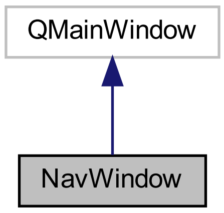
15.30 NavWindow Class Reference

```
#include <navwindow.h>
```

Inheritance diagram for NavWindow:



Collaboration diagram for NavWindow:



Public Member Functions

- NavWindow (QWidget ∗parent=nullptr)

  NavWindow.
- ∼NavWindow ()
- void drawGraph (int N, astar::node ∗node_array, int num_edges, astar::edge ∗edge_array, astar::cost ∗wts)

  drawGraph create ad draw topological graph
- void setPointers (astar::astar &as, tgraph::topmapprocessor &TP)

  setPointers set pointers rekared to graph processing and searching
- void setPepperRobotPointer (pepperInterface ∗pr, dispNav ∗d)

  setPepperRobotPointer
- void setKimfoldoffline (std::string kif)

  setKimfoldoffline

15.30.1 Detailed Description

Definition at line 38 of file navwindow.h.

15.30.2 Constructor & Destructor Documentation

15.30.2.1 NavWindow()

```
NavWindow::NavWindow (
              QWidget ∗ parent = nullptr )   [explicit]
```

NavWindow.

NavWindow::NavWindow.

Parameters

parent	

Definition at line 34 of file navwindow.cpp.

15.30.2.2 ∼NavWindow()

```
NavWindow::∼NavWindow ( )
```

Definition at line 179 of file navwindow.cpp.

15.30.3 Member Function Documentation

15.30.3.1 drawGraph()

```
void NavWindow::drawGraph (
            int N,
            astar::node * node_array,
            int num_edges,
            astar::edge * edge_array,
            astar::cost * wts )
```

drawGraph create ad draw topological graph

Parameters

N	numebr of nodes
node_array	nodes list
num_edges	number of edges
edge_array	edge list
wts	edge weights

Definition at line 100 of file navwindow.cpp.

15.30.3.2 setKimfoldoffline()

```
void NavWindow::setKimfoldoffline (
            std::string kif )
```

setKimfoldoffline

Parameters

kif	

Definition at line 772 of file navwindow.cpp.

15.30.3.3 setPepperRobotPointer()

```
void NavWindow::setPepperRobotPointer (
            pepperInterface * pr,
            dispNav * d )
```

setPepperRobotPointer

Parameters

pr	

Definition at line 314 of file navwindow.cpp.

15.30.3.4 setPointers()

```
void NavWindow::setPointers (
            astar::astar & as,
            tgraph::topmapprocessor & TP )
```

setPointers set pointers rekared to graph processing and searching

Parameters

as	Pointer to astar search
TP	Pointer to topological garph processor

Definition at line 303 of file navwindow.cpp.

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

- navmain/maingui/navwindow.h
- navmain/maingui/navwindow.cpp

15.31 tgraph::node Struct Reference

The node struct each node has nodeid starting from 0. nodename : higher level id for node.

```
#include <topograph_processor.h>
```

Public Attributes

- int nodeid
- std::string nodename

15.31.1 Detailed Description

The node struct each node has nodeid starting from 0. nodename : higher level id for node.

Definition at line 37 of file topograph_processor.h.

15.31.2 Member Data Documentation

15.31.2.1 nodeid

```
int tgraph::node::nodeid
```

Definition at line 38 of file topograph_processor.h.

15.31.2.2 nodename

```
std::string tgraph::node::nodename
```

Definition at line 39 of file topograph_processor.h.

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

- navmain/topograph_processor.h

15.32 Node Struct Reference

```
#include <PairwiseLineMatching.hh>
```

Public Attributes

- unsigned int leftLineID
- unsigned int rightLineID

15.32.1 Detailed Description

Definition at line 18 of file PairwiseLineMatching.hh.

15.32.2 Member Data Documentation

15.32.2.1 leftLineID

```
unsigned int Node::leftLineID
```

Definition at line 19 of file PairwiseLineMatching.hh.

15.32.2.2 rightLineID

```
unsigned int Node::rightLineID
```

Definition at line 20 of file PairwiseLineMatching.hh.

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

- linenav/PairwiseLineMatching.hh

15.33 OctaveLine Struct Reference

```
#include <LineDescriptor.hh>
```

Public Attributes

- unsigned int octaveCount
- unsigned int lineIDInOctave
- unsigned int lineIDInScaleLineVec
- float lineLength

15.33.1 Detailed Description

Definition at line 19 of file LineDescriptor.hh.

15.33.2 Member Data Documentation

15.33.2.1 lineIDInOctave

```
unsigned int OctaveLine::lineIDInOctave
```

Definition at line 21 of file LineDescriptor.hh.

15.33.2.2 lineIDInScaleLineVec

```
unsigned int OctaveLine::lineIDInScaleLineVec
```

Definition at line 22 of file LineDescriptor.hh.

15.33.2.3 lineLength

```
float OctaveLine::lineLength
```

Definition at line 23 of file LineDescriptor.hh.

15.33.2.4 octaveCount

```
unsigned int OctaveLine::octaveCount
```

Definition at line 20 of file LineDescriptor.hh.

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

- linenav/LineDescriptor.hh

15.34 OctaveSingleLine Struct Reference

```
#include <LineStructure.hh>
```

Public Attributes

- float startPointX
- float startPointY
- float endPointX
- float endPointY
- float sPointInOctaveX
- float sPointInOctaveY
- float ePointInOctaveX
- float ePointInOctaveY
- float direction
- float salience
- float lineLength
- unsigned int numOfPixels
- unsigned int octaveCount
- std::vector< float > descriptor
- std::vector< unsigned char > bdescriptor

15.34.1 Detailed Description

Definition at line 48 of file LineStructure.hh.

15.34.2 Member Data Documentation

15.34.2.1 bdescriptor

```
std::vector<unsigned char> OctaveSingleLine::bdescriptor
```

Definition at line 74 of file LineStructure.hh.

15.34.2.2 descriptor

```
std::vector<float> OctaveSingleLine::descriptor
```

Definition at line 72 of file LineStructure.hh.

15.34.2.3 direction

```
float OctaveSingleLine::direction
```

Definition at line 62 of file LineStructure.hh.

15.34.2.4 endPointX

```
float OctaveSingleLine::endPointX
```

Definition at line 54 of file LineStructure.hh.

15.34.2.5 endPointY

```
float OctaveSingleLine::endPointY
```

Definition at line 55 of file LineStructure.hh.

15.34.2.6 ePointInOctaveX

```
float OctaveSingleLine::ePointInOctaveX
```

Definition at line 59 of file LineStructure.hh.

15.34.2.7 ePointInOctaveY

```
float OctaveSingleLine::ePointInOctaveY
```

Definition at line 60 of file LineStructure.hh.

15.34.2.8 lineLength

```
float OctaveSingleLine::lineLength
```

Definition at line 66 of file LineStructure.hh.

15.34.2.9 numOfPixels

```
unsigned int OctaveSingleLine::numOfPixels
```

Definition at line 68 of file LineStructure.hh.

15.34.2.10 octaveCount

```
unsigned int OctaveSingleLine::octaveCount
```

Definition at line 70 of file LineStructure.hh.

15.34.2.11 salience

```
float OctaveSingleLine::salience
```

Definition at line 64 of file LineStructure.hh.

15.34.2.12 sPointInOctaveX

```
float OctaveSingleLine::sPointInOctaveX
```

Definition at line 57 of file LineStructure.hh.

15.34.2.13 sPointInOctaveY

```
float OctaveSingleLine::sPointInOctaveY
```

Definition at line 58 of file LineStructure.hh.

15.34.2.14 startPointX

```
float OctaveSingleLine::startPointX
```

Definition at line 52 of file LineStructure.hh.

15.34.2.15 startPointY

```
float OctaveSingleLine::startPointY
```

Definition at line 53 of file LineStructure.hh.

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

- linenav/LineStructure.hh

15.35 PairwiseLineMatching Class Reference

```
#include <PairwiseLineMatching.hh>
```

Public Member Functions

- PairwiseLineMatching ()
- void LineMatching (ScaleLines &linesInLeft, ScaleLines &linesInRight, std::vector< unsigned int > &matchResult)

15.35.1 Detailed Description

Definition at line 67 of file PairwiseLineMatching.hh.

15.35.2 Constructor & Destructor Documentation

15.35.2.1 PairwiseLineMatching()

```
PairwiseLineMatching::PairwiseLineMatching ( )  [inline]
```

Definition at line 70 of file PairwiseLineMatching.hh.

15.35.3 Member Function Documentation

15.35.3.1 LineMatching()

```
void PairwiseLineMatching::LineMatching (
             ScaleLines & linesInLeft,
             ScaleLines & linesInRight,
             std::vector< unsigned int > & matchResult )
```

Definition at line 63 of file PairwiseLineMatching.cpp.

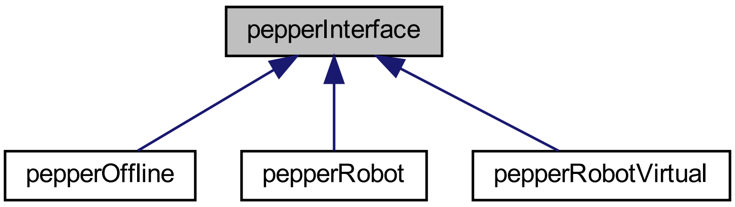
The documentation for this class was generated from the following files:

- linenav/PairwiseLineMatching.hh
- linenav/PairwiseLineMatching.cpp

15.36 pepperInterface Class Reference

```
#include <pepperInterface.h>
```

Inheritance diagram for pepperInterface:



Public Member Functions

- pepperInterface (const std::string &opt_ip)
- virtual void openCamera (int id)=0
- virtual void startBaseMotionController ()=0
- virtual void initPosture ()=0
- virtual void startPepper (int id)=0
- virtual void getCurrImage (cv::Mat &I)=0
- virtual void openDepthCamera ()=0
- virtual void getCurrDepthImage (cv::Mat &I)=0
- virtual void setBaseVelocities (float vr, float wr)=0
- virtual void setBaseVelocities (float vr, float vs, float wr)=0
- virtual std::vector< float > getOdometryReading ()=0
- virtual void rotate180 ()=0
- virtual void wait (long t)=0
- virtual void adjusthead ()=0
- virtual cv::Mat getK ()=0
- virtual cv::Mat getKd ()=0
- virtual int getid ()=0
- virtual int getmode ()=0
- virtual ∼pepperInterface ()=0

15.36.1 Detailed Description

Definition at line 28 of file pepperInterface.h.

15.36.2 Constructor & Destructor Documentation

15.36.2.1 pepperInterface()

```
pepperInterface::pepperInterface (
            const std::string & opt_ip )
```

Definition at line 25 of file pepperInterface.cpp.

15.36.2.2 ∼pepperInterface()

```
pepperInterface::∼pepperInterface ( )  [pure virtual]
```

Definition at line 32 of file pepperInterface.cpp.

15.36.3 Member Function Documentation

15.36.3.1 adjusthead()

```
virtual void pepperInterface::adjusthead ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.2 getCurrDepthImage()

```
virtual void pepperInterface::getCurrDepthImage (
            cv::Mat & I )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.3 getCurrImage()

```
virtual void pepperInterface::getCurrImage (
            cv::Mat & I )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.4 getid()

```
virtual int pepperInterface::getid ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.5 getK()

```
virtual cv::Mat pepperInterface::getK ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.6 getKd()

```
virtual cv::Mat pepperInterface::getKd ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.7 getmode()

```
virtual int pepperInterface::getmode ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.8 getOdometryReading()

```
virtual std::vector<float> pepperInterface::getOdometryReading ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.9 initPosture()

```
virtual void pepperInterface::initPosture ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.10 openCamera()

```
virtual void pepperInterface::openCamera (
            int id )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.11 openDepthCamera()

```
virtual void pepperInterface::openDepthCamera ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.12 rotate180()

```
virtual void pepperInterface::rotate180 ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.13 setBaseVelocities() [1/2]

```
virtual void pepperInterface::setBaseVelocities (
            float vr,
            float vs,
            float wr )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.14 setBaseVelocities() [2/2]

```
virtual void pepperInterface::setBaseVelocities (
            float vr,
            float wr )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.15 startBaseMotionController()

```
virtual void pepperInterface::startBaseMotionController ( )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.16 startPepper()

```
virtual void pepperInterface::startPepper (
            int id )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

15.36.3.17 wait()

```
virtual void pepperInterface::wait (
            long t )  [pure virtual]
```

Implemented in pepperRobotVirtual, pepperRobot, and pepperOffline.

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

- navmain/pepperInterface.h
- navmain/pepperInterface.cpp

15.37 pepperNavigation Class Reference

The pepperNavigation class.

`#include <peppernavigation.h>`

Public Member Functions

- pepperNavigation (cv::Mat &K, dispNav ∗dn)

  pepperNavigation
- void setfreespacenav (cv::Mat &Kd)

  setfreespacenav enable free space navigation
- void setPath (kimRead ∗KF)

  setPath
- void localise (cv::Mat &I)

  localise perform global localization in the path defined by reference image list
- float navigate (cv::Mat &cim)

  navigate Perform Succesive Image-Based Navigation
- int continueNav (float &turnval)

  continueNav check if reference images need to be switched
- void closedisp ()

  closedisp

- float getturninginkim ()

  getturninginkim
- float getinitdisplacemt (cv::Mat &cim)

  getinitdisplacemt get lateral displacement with refernce images
- void setofileid (int id)

  setofileid filenmaes for debuging
- void setinitialpose (std::vector< float > &pose)

  setinitialpose set odometry pose at the start of navigation
- void setcurrentpose (std::vector< float > &pose)

  setcurrentpose
- float getvelfreespace (cv::Mat &Id)

  getvelfreespa current depth imagece free-space navigation
- float getH ()

  getH fusion of control ref. Paper
- void setbasevel (double vt)

15.37.1 Detailed Description

The pepperNavigation class.

Definition at line 37 of file peppernavigation.h.

15.37.2 Constructor & Destructor Documentation

15.37.2.1 pepperNavigation()

```
pepperNavigation::pepperNavigation (
            cv::Mat & K,
            dispNav * dn )  [inline]
```

pepperNavigation

Parameters

K	instrinsic matrix of RGB camera

Definition at line 59 of file peppernavigation.h.

15.37.3 Member Function Documentation

15.37.3.1 closedisp()

```
void pepperNavigation::closedisp ( )  [inline]
```

closedisp

Definition at line 152 of file peppernavigation.h.

15.37.3.2 continueNav()

```
int pepperNavigation::continueNav (
            float & turnval ) [inline]
```

continueNav check if reference images need to be switched

Parameters

turnval	turning value between refernce images

Returns

0 => end of navigation 2=> switch reference images 1=> just continue

Definition at line 130 of file peppernavigation.h.

15.37.3.3 getH()

```
float pepperNavigation::getH ( ) [inline]
```

getH fusion of control ref. Paper

Returns

H

Definition at line 253 of file peppernavigation.h.

15.37.3.4 getinitdisplacemt()

```
float pepperNavigation::getinitdisplacemt (
            cv::Mat & cim ) [inline]
```

getinitdisplacemt get lateral displacement with refernce images

Parameters

cim	curr images

Returns

dispalcement

Definition at line 173 of file peppernavigation.h.

15.37.3.5 getturninginkim()

```
float pepperNavigation::getturninginkim ( )  [inline]
```

getturninginkim

Returns

turnval

Definition at line 163 of file peppernavigation.h.

15.37.3.6 getvelfreespace()

```
float pepperNavigation::getvelfreespace (
            cv::Mat & Id )  [inline]
```

getvelfreespa current depth imagece free-space navigation

Parameters

Id	

Returns

rotational velocity to drive into free space

Definition at line 242 of file peppernavigation.h.

15.37.3.7 localise()

```
void pepperNavigation::localise (
            cv::Mat & I )  [inline]
```

localise perform global localization in the path defined by reference image list

Parameters

I	current RGB image

Definition at line 97 of file peppernavigation.h.

15.37.3.8 navigate()

```
float pepperNavigation::navigate (
            cv::Mat & cim )  [inline]
```

navigate Perform Succesive Image-Based Navigation

Parameters

cim	Current Image

Returns

Rottaional Velocity

Definition at line 109 of file peppernavigation.h.

15.37.3.9 setbasevel()

```
void pepperNavigation::setbasevel (
             double vt )  [inline]
```

set base forward velocity

Definition at line 263 of file peppernavigation.h.

15.37.3.10 setcurrentpose()

```
void pepperNavigation::setcurrentpose (
             std::vector< float > & pose )  [inline]
```

setcurrentpose

Parameters

pose	current ododmetry reading

Definition at line 230 of file peppernavigation.h.

15.37.3.11 setfreespacenav()

```
void pepperNavigation::setfreespacenav (
             cv::Mat & Kd )  [inline]
```

setfreespacenav enable free space navigation

Parameters

Kd	instrinsic matrix of depth camera

Definition at line 75 of file peppernavigation.h.

15.37.3.12 setinitialpose()

```
void pepperNavigation::setinitialpose (
             std::vector< float > & pose )  [inline]
```

setinitialpose set odometry pose at the start of navigation

Parameters

pose	ododmetry reading

Definition at line 219 of file peppernavigation.h.

15.37.3.13 setofileid()

```
void pepperNavigation::setofileid (
             int id )  [inline]
```

setofileid filenmaes for debuging

Parameters

id	

Definition at line 184 of file peppernavigation.h.

15.37.3.14 setPath()

```
void pepperNavigation::setPath (
             kimRead * KF )  [inline]
```

setPath

Parameters

KF	pointer of reference image list

Definition at line 86 of file peppernavigation.h.

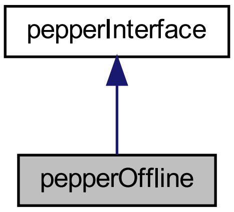
The documentation for this class was generated from the following file:

- navmain/peppernavigation.h

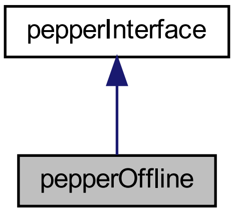
15.38 pepperOffline Class Reference

```
#include <pepperOffline.h>
```

Inheritance diagram for pepperOffline:



Collaboration diagram for pepperOffline:



Public Member Functions

- pepperOffline (const std::string &opt_ip)

  pepperOffline
- void openCamera (int id=0)

  openCamera reads image file names from the folder
- void openDepthCamera ()
- void startBaseMotionController ()
- void initPosture ()
- void startPepper (int id)

  startPepper initialies image path for image-based localizations
- void getCurrImage (cv::Mat &I)

  getCurrImage reads image from folder
- void getCurrDepthImage (cv::Mat &I)
- void setBaseVelocities (float vr, float wr)
- void setBaseVelocities (float vr, float vs, float wr)
- std::vector< float > getOdometryReading ()
- void rotate180 ()

- void wait (long t)

  wait delay in ms
- cv::Mat getK ()
- cv::Mat getKd ()
- int getmode ()

  getmode tells it is offline mode
- void adjusthead ()
- int getid ()

15.38.1 Detailed Description

Definition at line 32 of file pepperOffline.h.

15.38.2 Constructor & Destructor Documentation

15.38.2.1 pepperOffline()

```
pepperOffline::pepperOffline (
            const std::string & opt_ip )
```

pepperOffline

Parameters

opt←↩ _ip	= path of the folder where navigation image lies

Definition at line 31 of file pepperOffline.cpp.

15.38.3 Member Function Documentation

15.38.3.1 adjusthead()

```
void pepperOffline::adjusthead ( )  [virtual]
```

Implements pepperInterface.

Definition at line 87 of file pepperOffline.cpp.

15.38.3.2 getCurrDepthImage()

```
void pepperOffline::getCurrDepthImage (
             cv::Mat & I )  [virtual]
```

Implements pepperInterface.

Definition at line 60 of file pepperOffline.cpp.

15.38.3.3 getCurrImage()

```
void pepperOffline::getCurrImage (
             cv::Mat & I )  [virtual]
```

getCurrImage reads image from folder

Parameters

I	

Implements pepperInterface.

Definition at line 91 of file pepperOffline.cpp.

15.38.3.4 getid()

```
int pepperOffline::getid ( )  [virtual]
```

Implements pepperInterface.

Definition at line 125 of file pepperOffline.cpp.

15.38.3.5 getK()

```
cv::Mat pepperOffline::getK ( )  [virtual]
```

return intrinsic parameters

Implements pepperInterface.

Definition at line 64 of file pepperOffline.cpp.

15.38.3.6 getKd()

```
cv::Mat pepperOffline::getKd ( )  [virtual]
```

Implements pepperInterface.

Definition at line 67 of file pepperOffline.cpp.

15.38.3.7 getmode()

```
int pepperOffline::getmode ( )  [virtual]
```

getmode tells it is offline mode

Returns

1

Implements pepperInterface.

Definition at line 121 of file pepperOffline.cpp.

15.38.3.8 getOdometryReading()

```
std::vector< float > pepperOffline::getOdometryReading ( )  [virtual]
```

Implements pepperInterface.

Definition at line 107 of file pepperOffline.cpp.

15.38.3.9 initPosture()

```
void pepperOffline::initPosture ( )  [virtual]
```

Implements pepperInterface.

Definition at line 75 of file pepperOffline.cpp.

15.38.3.10 openCamera()

```
void pepperOffline::openCamera (
             int id = 0 )  [virtual]
```

openCamera reads image file names from the folder

Parameters

id	

Implements pepperInterface.

Definition at line 49 of file pepperOffline.cpp.

15.38.3.11 openDepthCamera()

```
void pepperOffline::openDepthCamera ( )  [virtual]
```

Implements pepperInterface.

Definition at line 56 of file pepperOffline.cpp.

15.38.3.12 rotate180()

```
void pepperOffline::rotate180 ( )  [virtual]
```

Implements pepperInterface.

Definition at line 112 of file pepperOffline.cpp.

15.38.3.13 setBaseVelocities() [1/2]

```
void pepperOffline::setBaseVelocities (
             float vr,
             float vs,
             float wr )  [virtual]
```

Implements pepperInterface.

Definition at line 103 of file pepperOffline.cpp.

15.38.3.14 setBaseVelocities() [2/2]

```
void pepperOffline::setBaseVelocities (
             float vr,
             float wr )  [virtual]
```

Implements pepperInterface.

Definition at line 98 of file pepperOffline.cpp.

15.38.3.15 startBaseMotionController()

```
void pepperOffline::startBaseMotionController ( )  [virtual]
```

Implements pepperInterface.

Definition at line 71 of file pepperOffline.cpp.

15.38.3.16 startPepper()

```
void pepperOffline::startPepper (
             int id = 0 )  [virtual]
```

startPepper initialies image path for image-based localizations

Parameters

id	

Implements pepperInterface.

Definition at line 79 of file pepperOffline.cpp.

15.38.3.17 wait()

```
void pepperOffline::wait (
             long t )  [virtual]
```

wait delay in ms

Implements pepperInterface.

Definition at line 116 of file pepperOffline.cpp.

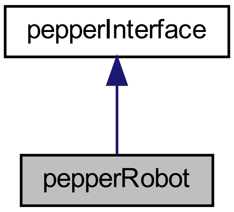
The documentation for this class was generated from the following files:

- navmain/pepperOffline.h
- navmain/pepperOffline.cpp

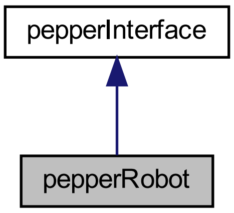
15.39 pepperRobot Class Reference

```
#include <pepperRobot.h>
```

Inheritance diagram for pepperRobot:



Collaboration diagram for pepperRobot:



Public Member Functions

- pepperRobot (const std::string &opt_ip)

  pepperRobot
- void openCamera (int id=0)

  openCamera Start RGB Camera
- void openDepthCamera ()

  openDepthCamera start Depth Camera
- void startBaseMotionController ()

  startBaseMotionController
- void initPosture ()

  initPosture set initial prefdefined posture for navigation
- void startPepper (int id)

  startPepper
- void getCurrImage (cv::Mat &I)

  getCurrImage acquire image from RGB camera
- void getCurrDepthImage (cv::Mat &I)

getCurrDepthImage acquire image from depth camera
- void setBaseVelocities (float vr, float wr)

  setBaseVelocities
- void setBaseVelocities (float vr, float vs, float wr)

  setBaseVelocities
- std::vector< float > getOdometryReading ()

  getOdometryReading read current odometry reading
- void rotate180 ()

  rotate180 rotate robot by 180
- void wait (long t)

  wait delay
- void adjusthead ()

  adjusthead correct the head postion so that the robot always look forward
- cv::Mat getK ()

  getK instrinsic parameter of top RGB camera
- cv::Mat getKd ()

  getKd instrinsic parameter of depth camera
- int getmode ()

  getmode tells it is the online navigation mode for pepper
- int getid ()

  getid returns camera id

15.39.1 Detailed Description

Definition at line 30 of file pepperRobot.h.

15.39.2 Constructor & Destructor Documentation

15.39.2.1 pepperRobot()

```
pepperRobot::pepperRobot (
            const std::string & opt_ip )
```

pepperRobot

Parameters

opt←_ip	url of Pepper

Definition at line 32 of file pepperRobot.cpp.

15.39.3 Member Function Documentation

15.39.3.1 adjusthead()

```
void pepperRobot::adjusthead ( )  [virtual]
```

adjusthead correct the head postion so that the robot always look forward

Implements pepperInterface.

Definition at line 178 of file pepperRobot.cpp.

15.39.3.2 getCurrDepthImage()

```
void pepperRobot::getCurrDepthImage (
             cv::Mat & I )  [virtual]
```

getCurrDepthImage acquire image from depth camera

Parameters

I	image in cv::Mat

Implements pepperInterface.

Definition at line 201 of file pepperRobot.cpp.

15.39.3.3 getCurrImage()

```
void pepperRobot::getCurrImage (
             cv::Mat & I )  [virtual]
```

getCurrImage acquire image from RGB camera

Parameters

I	image in cv::Mat

Implements pepperInterface.

Definition at line 190 of file pepperRobot.cpp.

15.39.3.4 getid()

```
int pepperRobot::getid ( )  [virtual]
```

getid returns camera id

Returns

0=> top cam 1=>bttom cam

Implements pepperInterface.

Definition at line 286 of file pepperRobot.cpp.

15.39.3.5 getK()

```
cv::Mat pepperRobot::getK ( )  [virtual]
```

getK instrinsic parameter of top RGB camera

Returns

Instrinsic Matrix

Implements pepperInterface.

Definition at line 101 of file pepperRobot.cpp.

15.39.3.6 getKd()

```
cv::Mat pepperRobot::getKd ( )  [virtual]
```

getKd instrinsic parameter of depth camera

Returns

Instrinsic Matrix

Implements pepperInterface.

Definition at line 112 of file pepperRobot.cpp.

15.39.3.7 getmode()

```
int pepperRobot::getmode ( )  [virtual]
```

getmode tells it is the online navigation mode for pepper

Returns

0

Implements pepperInterface.

Definition at line 276 of file pepperRobot.cpp.

15.39.3.8 getOdometryReading()

```
std::vector< float > pepperRobot::getOdometryReading ( )  [virtual]
```

getOdometryReading read current odometry reading

Returns

odometry value (x, y, theta)

Implements pepperInterface.

Definition at line 235 of file pepperRobot.cpp.

15.39.3.9 initPosture()

```
void pepperRobot::initPosture ( )  [virtual]
```

initPosture set initial prefdefined posture for navigation

Implements pepperInterface.

Definition at line 145 of file pepperRobot.cpp.

15.39.3.10 openCamera()

```
void pepperRobot::openCamera (
             int id = 0 )  [virtual]
```

openCamera Start RGB Camera

Parameters

id	top= 0 buttom =1

Implements pepperInterface.

Definition at line 53 of file pepperRobot.cpp.

15.39.3.11 openDepthCamera()

```
void pepperRobot::openDepthCamera ( )  [virtual]
```

openDepthCamera start Depth Camera

Implements pepperInterface.

Definition at line 81 of file pepperRobot.cpp.

15.39.3.12 rotate180()

```
void pepperRobot::rotate180 ( )  [virtual]
```

rotate180 rotate robot by 180

Implements pepperInterface.

Definition at line 245 of file pepperRobot.cpp.

15.39.3.13 setBaseVelocities() [1/2]

```
void pepperRobot::setBaseVelocities (
            float vr,
            float vs,
            float wr )  [virtual]
```

setBaseVelocities

Parameters

vr	forward velocity
vs	lateral transaltional velocity
wr	rotational velocity

Implements pepperInterface.

Definition at line 224 of file pepperRobot.cpp.

15.39.3.14 setBaseVelocities() [2/2]

```
void pepperRobot::setBaseVelocities (
            float vr,
            float wr )  [virtual]
```

setBaseVelocities

Parameters

vr	forward velocity
wr	rotational velocity

Implements pepperInterface.

Definition at line 212 of file pepperRobot.cpp.

15.39.3.15 startBaseMotionController()

```
void pepperRobot::startBaseMotionController ( )  [virtual]
```

startBaseMotionController

Implements pepperInterface.

Definition at line 122 of file pepperRobot.cpp.

15.39.3.16 startPepper()

```
void pepperRobot::startPepper (
            int id = 0 )  [virtual]
```

startPepper

Parameters

id	RGB camera id

Implements pepperInterface.

Definition at line 166 of file pepperRobot.cpp.

15.39.3.17 wait()

```
void pepperRobot::wait (
            long t )  [virtual]
```

wait delay

Parameters

t	time in ms

Implements pepperInterface.

Definition at line 296 of file pepperRobot.cpp.

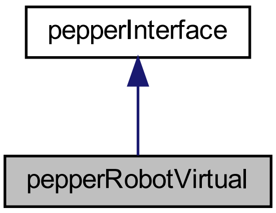
The documentation for this class was generated from the following files:

- navmain/pepperRobot.h
- navmain/pepperRobot.cpp
- navmain/pepperRobotVirtual.cpp

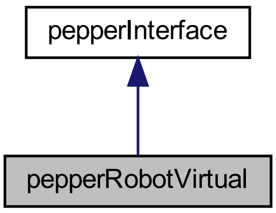
15.40 pepperRobotVirtual Class Reference

```
#include <pepperRobotVirtual.h>
```

Inheritance diagram for pepperRobotVirtual:



Collaboration diagram for pepperRobotVirtual:



Public Member Functions

- pepperRobotVirtual (const std::string &opt_ip)

  pepperRobotVirtual
- void openCamera (int id=0)

  openCamera Start RGB Camera
- void openDepthCamera ()

  openDepthCamera start Depth Camera
- void startBaseMotionController ()

  startBaseMotionController
- void initPosture ()

  initPosture set initial prefdefined posture for navigation
- void startPepper (int id)

  startPepper
- void getCurrImage (cv::Mat &I)

  getCurrImage acquire image from RGB camera
- void getCurrDepthImage (cv::Mat &I)

getCurrDepthImage acquire image from depth camera
- void setBaseVelocities (float vr, float wr)

  setBaseVelocities
- void setBaseVelocities (float vr, float vs, float wr)

  setBaseVelocities
- std::vector< float > getOdometryReading ()

  getOdometryReading read current odometry reading
- void rotate180 ()

  rotate180 rotate robot by 180
- void wait (long t)

  wait delay
- void adjusthead ()

  adjusthead correct the head postion so that the robot always look forward
- cv::Mat getK ()

  getK instrinsic parameter of top RGB camera
- cv::Mat getKd ()

  getKd instrinsic parameter of depth camera
- int getmode ()

  getmode tells it is the online navigation mode for pepper
- int getid ()

  getid returns camera id

15.40.1 Detailed Description

Definition at line 32 of file pepperRobotVirtual.h.

15.40.2 Constructor & Destructor Documentation

15.40.2.1 pepperRobotVirtual()

```
pepperRobotVirtual::pepperRobotVirtual (
            const std::string & opt_ip )
```

pepperRobotVirtual

pepperRobot

Parameters

opt←_ip	iamge folder
opt←_ip	url of Pepper

Definition at line 34 of file pepperRobotVirtual.cpp.

15.40.3 Member Function Documentation

15.40.3.1 adjusthead()

```
void pepperRobotVirtual::adjusthead ( )  [virtual]
```

adjusthead correct the head postion so that the robot always look forward

Implements pepperInterface.

Definition at line 189 of file pepperRobotVirtual.cpp.

15.40.3.2 getCurrDepthImage()

```
void pepperRobotVirtual::getCurrDepthImage (
             cv::Mat & I )  [virtual]
```

getCurrDepthImage acquire image from depth camera

Parameters

I	image in cv::Mat

Implements pepperInterface.

Definition at line 213 of file pepperRobotVirtual.cpp.

15.40.3.3 getCurrImage()

```
void pepperRobotVirtual::getCurrImage (
             cv::Mat & I )  [virtual]
```

getCurrImage acquire image from RGB camera

Parameters

I	image in cv::Mat

Implements pepperInterface.

Definition at line 201 of file pepperRobotVirtual.cpp.

15.40.3.4 getid()

```
int pepperRobotVirtual::getid ( )  [virtual]
```

getid returns camera id

Returns

0=> top cam 1=>bttom cam

Implements pepperInterface.

Definition at line 303 of file pepperRobotVirtual.cpp.

15.40.3.5 getK()

```
cv::Mat pepperRobotVirtual::getK ( )  [virtual]
```

getK instrinsic parameter of top RGB camera

Returns

Instrinsic Matrix

Implements pepperInterface.

Definition at line 112 of file pepperRobotVirtual.cpp.

15.40.3.6 getKd()

```
cv::Mat pepperRobotVirtual::getKd ( )  [virtual]
```

getKd instrinsic parameter of depth camera

Returns

Instrinsic Matrix

Implements pepperInterface.

Definition at line 123 of file pepperRobotVirtual.cpp.

15.40.3.7 getmode()

```
int pepperRobotVirtual::getmode ( )  [virtual]
```

getmode tells it is the online navigation mode for pepper

Returns

0

1

Implements pepperInterface.

Definition at line 293 of file pepperRobotVirtual.cpp.

15.40.3.8 getOdometryReading()

```
std::vector<float> pepperRobotVirtual::getOdometryReading ( )  [virtual]
```

getOdometryReading read current odometry reading

Returns

odometry value (x, y, theta)

Implements pepperInterface.

15.40.3.9 initPosture()

```
void pepperRobotVirtual::initPosture ( )  [virtual]
```

initPosture set initial prefdefined posture for navigation

Implements pepperInterface.

Definition at line 156 of file pepperRobotVirtual.cpp.

15.40.3.10 openCamera()

```
void pepperRobotVirtual::openCamera (
             int id = 0 )  [virtual]
```

openCamera Start RGB Camera

Parameters

id	top= 0 buttom =1

Implements pepperInterface.

Definition at line 60 of file pepperRobotVirtual.cpp.

15.40.3.11 openDepthCamera()

```
void pepperRobotVirtual::openDepthCamera ( )  [virtual]
```

openDepthCamera start Depth Camera

Implements pepperInterface.

Definition at line 92 of file pepperRobotVirtual.cpp.

15.40.3.12 rotate180()

```
void pepperRobotVirtual::rotate180 ( )  [virtual]
```

rotate180 rotate robot by 180

Implements pepperInterface.

Definition at line 262 of file pepperRobotVirtual.cpp.

15.40.3.13 setBaseVelocities() [1/2]

```
void pepperRobotVirtual::setBaseVelocities (
             float vr,
             float vs,
             float wr )  [virtual]
```

setBaseVelocities

Parameters

vr	forward velocity
vs	lateral transaltional velocity
wr	rotational velocity

Implements pepperInterface.

Definition at line 236 of file pepperRobotVirtual.cpp.

15.40.3.14 setBaseVelocities() [2/2]

```
void pepperRobotVirtual::setBaseVelocities (
             float vr,
             float wr )  [virtual]
```

setBaseVelocities

Parameters

vr	forward velocity
wr	rotational velocity

Implements pepperInterface.

Definition at line 224 of file pepperRobotVirtual.cpp.

15.40.3.15 startBaseMotionController()

```
void pepperRobotVirtual::startBaseMotionController ( )  [virtual]
```

startBaseMotionController

Implements pepperInterface.

Definition at line 133 of file pepperRobotVirtual.cpp.

15.40.3.16 startPepper()

```
void pepperRobotVirtual::startPepper (
             int id = 0 )  [virtual]
```

startPepper

Parameters

id	RGB camera id

Implements pepperInterface.

Definition at line 177 of file pepperRobotVirtual.cpp.

15.40.3.17 wait()

```
void pepperRobotVirtual::wait (
            long t )  [virtual]
```

wait delay

Parameters

t	time in ms

Implements pepperInterface.

Definition at line 313 of file pepperRobotVirtual.cpp.

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

- navmain/pepperRobotVirtual.h
- navmain/pepperRobotVirtual.cpp

15.41 pepperServices Class Reference

The pepperServices class.

`#include <pepperevents.h>`

Public Member Functions

- pepperServices (qi::AnyObject &almemory)

  pepperServices
- void moveCallback (const std::string &key, const qi::AnyValue &value, const qi::AnyValue &message)

  moveCallback
- void armsCallback (const std::string &key, const qi::AnyValue &value, const qi::AnyValue &message)

  armsCallback

Public Attributes

- bool eventraised

15.41.1 Detailed Description

The pepperServices class.

Definition at line 29 of file pepperevents.h.

15.41.2 Constructor & Destructor Documentation

15.41.2.1 pepperServices()

```
pepperServices::pepperServices (
            qi::AnyObject & almemory )  [inline]
```

pepperServices

Parameters

almemory	AL::Memory pointer

Definition at line 37 of file pepperevents.h.

15.41.3 Member Function Documentation

15.41.3.1 armsCallback()

```
void pepperServices::armsCallback (
            const std::string & key,
            const qi::AnyValue & value,
            const qi::AnyValue & message )  [inline]
```

armsCallback

Definition at line 68 of file pepperevents.h.

15.41.3.2 moveCallback()

```
void pepperServices::moveCallback (
            const std::string & key,
            const qi::AnyValue & value,
            const qi::AnyValue & message )  [inline]
```

moveCallback

Definition at line 49 of file pepperevents.h.

15.41.4 Member Data Documentation

15.41.4.1 eventraised

```
bool pepperServices::eventraised
```

Definition at line 31 of file pepperevents.h.

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

- navmain/pepperevents.h

15.42 Pixel Struct Reference

```
#include <EDLineDetector.hh>
```

Public Attributes

- unsigned int x
- unsigned int y

15.42.1 Detailed Description

Definition at line 54 of file EDLineDetector.hh.

15.42.2 Member Data Documentation

15.42.2.1 x

```
unsigned int Pixel::x
```

Definition at line 55 of file EDLineDetector.hh.

15.42.2.2 y

```
unsigned int Pixel::y
```

Definition at line 56 of file EDLineDetector.hh.

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

- linenav/EDLineDetector.hh

15.43 AL::Math::Pose2D Struct Reference

A pose in a 2-dimentional space.

```
#include <alpose2d.h>
```

Public Member Functions

- Pose2D ()

  Create a Pose2D initialized with 0.0f.
- Pose2D (float pInit)

  Create a Pose2D initialize with the same float.
- Pose2D (float pX, float pY, float pTheta)

  Create a Pose2D initialized with explicit value.
- Pose2D (const std::vector< float > &pFloats)

  Create a Pose2D with an std::vector.
- Pose2D operator+ (const Pose2D &pPos2) const

  Overloading of operator + for Pose2D.
- Pose2D operator- (const Pose2D &pPos2) const

  Overloading of operator - for Pose2D.
- Pose2D operator+ (void) const

  Overloading of operator + for Pose2D.
- Pose2D operator- () const

  Overloading of operator - for Pose2D.
- Pose2D & operator+= (const Pose2D &pPos2)

  Overloading of operator += for Pose2D.
- Pose2D & operator-= (const Pose2D &pPos2)

  Overloading of operator -= for Pose2D.
- Pose2D & operator∗= (const Pose2D &pPos2)

  Overloading of operator ∗= for Pose2D.
- Pose2D operator∗ (const Pose2D &pPos2) const

  Overloading of operator ∗ for Pose2D.
- bool operator== (const Pose2D &pPos2) const

  Overloading of operator == for Pose2D.
- bool operator!= (const Pose2D &pPos2) const

  Overloading of operator != for Pose2D.
- Pose2D operator∗ (float pVal) const

  Overloading of operator ∗ for Pose2D.
- Pose2D operator/ (float pVal) const

  Overloading of operator / for Pose2D.
- Pose2D & operator∗= (float pVal)

  Overloading of operator ∗= for Pose2D.
- Pose2D & operator/= (float pVal)

  Overloading of operator /= for Pose2D.
- float distanceSquared (const Pose2D &pPos2) const

  Compute the squared distance between the actual Pose2D and the one give in argument.
- float distance (const Pose2D &pPos2) const

  Compute the distance between the actual Pose2D and the one give in argument.
- Pose2D inverse () const

  Return the inverse of the Pose2D
- Pose2D diff (const Pose2D &pPos2) const

  Compute the Pose2D between the actual Pose2D and the one given in argument:
- bool isNear (const Pose2D &pPos2, const float &pEpsilon=0.0001f) const

  Check if the actual Pose2D is near the one given in argument.
- void toVector (std::vector< float > &pReturnVector) const

  Return the Pose2D as a vector of float [x, y, theta].
- std::vector< float > toVector (void) const
- void writeToVector (std::vector< float >::iterator &pIt) const

  Write [x, y, theta] in the vector and update the iterator. It is assumed the vector has enough space.

- float norm () const

  Compute the norm of the current Pose2D.
- Pose2D normalize () const

  Normalize the current Pose2D position.
- float getAngle (void) const

  Returns the angle of the current Pose2D.

Static Public Member Functions

- static Pose2D fromPolarCoordinates (const float pRadius, const float pAngle)

  Create a Pose2D from polar coordinates.

Public Attributes

- float x
- float y
- float theta

15.43.1 Detailed Description

A pose in a 2-dimentional space.

On a plane a position is totally defined by the postions x,y and the rotation theta.

Definition at line 25 of file alpose2d.h.

15.43.2 Constructor & Destructor Documentation

15.43.2.1 Pose2D() `[1/4]`

```
AL::Math::Pose2D::Pose2D ( )
```

Create a Pose2D initialized with 0.0f.

$$\left[\begin{array}{c} x \\ y \\ theta \end{array}\right] = \left[\begin{array}{c} 0.0 \\ 0.0 \\ 0.0 \end{array}\right]$$

Definition at line 15 of file alpose2d.cpp.

15.43.2.2 Pose2D() `[2/4]`

```
AL::Math::Pose2D::Pose2D (
            float pInit )  [explicit]
```

Create a Pose2D initialize with the same float.

$$\left[\begin{array}{c} x \\ y \\ theta \end{array}\right] = \left[\begin{array}{c} pInit \\ pInit \\ pInit \end{array}\right]$$

Parameters

pInit	the float value for each member

Definition at line 17 of file alpose2d.cpp.

15.43.2.3 Pose2D() [3/4]

```
AL::Math::Pose2D::Pose2D (
            float pX,
            float pY,
            float pTheta )  [explicit]
```

Create a Pose2D initialized with explicit value.

$$\left[\begin{array}{c} x \\ y \\ theta \end{array}\right] = \left[\begin{array}{c} pX \\ pY \\ pTheta \end{array}\right]$$

Parameters

pX	the float value for x
pY	the float value for y
pTheta	the float value for theta

Definition at line 19 of file alpose2d.cpp.

15.43.2.4 Pose2D() [4/4]

```
AL::Math::Pose2D::Pose2D (
            const std::vector< float > & pFloats )
```

Create a Pose2D with an std::vector.

$$\left[\begin{array}{c} x \\ y \\ theta \end{array}\right] = \left[\begin{array}{c} pFloats[0] \\ pFloats[1] \\ pFloats[2] \end{array}\right]$$

Parameters

pFloats	An std::vector<float> of size 3 for respectively:

x, y and theta

Definition at line 27 of file alpose2d.cpp.

15.43.3 Member Function Documentation

15.43.3.1 diff()

```
Pose2D AL::Math::Pose2D::diff (
             const Pose2D & pPos2 ) const
```

Compute the Pose2D between the actual Pose2D and the one given in argument:

result: inverse(pPos1)$*$pPos2

Parameters

pPos2	the second Pose2D

Definition at line 129 of file alpose2d.cpp.

15.43.3.2 distance()

```
float AL::Math::Pose2D::distance (
             const Pose2D & pPos2 ) const
```

Compute the distance between the actual Pose2D and the one give in argument.

$$\sqrt{(pPos1.x - pPos2.x)^2 + (pPos1.y - pPos2.y)^2}$$

Parameters

pPos2	the second Pose2D

Returns

the float distance between the two Pose2D

Definition at line 95 of file alpose2d.cpp.

15.43.3.3 distanceSquared()

```
float AL::Math::Pose2D::distanceSquared (
             const Pose2D & pPos2 ) const
```

Compute the squared distance between the actual Pose2D and the one give in argument.

This avoids doing the sqrt needed for a true distance.

$$(pPos1.x - pPos2.x)^2 + (pPos1.y - pPos2.y)^2$$

Parameters

pPos2	the second Pose2D

Returns

the float squared distance between the two Pose2D

Definition at line 90 of file alpose2d.cpp.

15.43.3.4 fromPolarCoordinates()

```
Pose2D AL::Math::Pose2D::fromPolarCoordinates (
             const float pRadius,
             const float pAngle )  [static]
```

Create a Pose2D from polar coordinates.

Parameters

pRadius	the polar radius
pAngle	the polar angle in radians

Returns

the Pose2D extracted from the polar coordinates

Definition at line 240 of file alpose2d.cpp.

15.43.3.5 getAngle()

```
float AL::Math::Pose2D::getAngle (
             void  ) const  [inline]
```

Returns the angle of the current Pose2D.

result: $$/atan2(pose.y, pose.x)$$

Definition at line 322 of file alpose2d.h.

15.43.3.6 inverse()

```
Pose2D AL::Math::Pose2D::inverse ( ) const
```

Return the inverse of the Pose2D

Definition at line 191 of file alpose2d.cpp.

15.43.3.7 isNear()

```
bool AL::Math::Pose2D::isNear (
             const Pose2D & pPos2,
             const float & pEpsilon = 0.0001f ) const
```

Check if the actual Pose2D is near the one given in argument.

Parameters

pPos2	the second Pose2D
pEpsilon	an optionnal epsilon distance - default: 0.0001

Returns

true if the distance between the two Pose2D is less than pEpsilon

Definition at line 182 of file alpose2d.cpp.

15.43.3.8 norm()

```
float AL::Math::Pose2D::norm ( ) const  [inline]
```

Compute the norm of the current Pose2D.

result: $$/sqrt(pose.x^{2} + pose.y^{2})$$

Definition at line 301 of file alpose2d.h.

15.43.3.9 normalize()

```
Pose2D AL::Math::Pose2D::normalize ( ) const
```

Normalize the current Pose2D position.

$pRes = \frac{pPos}{norm(pPos)}$

Returns

the Pose2D normalized

Definition at line 156 of file alpose2d.cpp.

15.43.3.10 operator"!=()

```
bool AL::Math::Pose2D::operator!= (
             const Pose2D & pPos2 ) const
```

Overloading of operator != for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 85 of file alpose2d.cpp.

15.43.3.11 operator∗() [1/2]

```
Pose2D AL::Math::Pose2D::operator* (
             const Pose2D & pPos2 ) const  [inline]
```

Overloading of operator ∗ for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 182 of file alpose2d.h.

15.43.3.12 operator∗() [2/2]

```
Pose2D AL::Math::Pose2D::operator* (
             float pVal ) const  [inline]
```

Overloading of operator ∗ for Pose2D.

Parameters

pVal	the float factor

Definition at line 206 of file alpose2d.h.

15.43.3.13 operator∗=() [1/2]

```
Pose2D & AL::Math::Pose2D::operator*= (
             const Pose2D & pPos2 )
```

Overloading of operator ∗= for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 48 of file alpose2d.cpp.

15.43.3.14 operator*=() [2/2]

```
Pose2D & AL::Math::Pose2D::operator*= (
             float pVal )
```

Overloading of operator *= for Pose2D.

Parameters

pVal	the float factor

Definition at line 110 of file alpose2d.cpp.

15.43.3.15 operator+() [1/2]

```
Pose2D AL::Math::Pose2D::operator+ (
             const Pose2D & pPos2 ) const  [inline]
```

Overloading of operator + for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 130 of file alpose2d.h.

15.43.3.16 operator+() [2/2]

```
Pose2D AL::Math::Pose2D::operator+ (
             void  ) const  [inline]
```

Overloading of operator + for Pose2D.

Definition at line 147 of file alpose2d.h.

15.43.3.17 operator+=()

```
Pose2D & AL::Math::Pose2D::operator+= (
             const Pose2D & pPos2 )
```

Overloading of operator += for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 62 of file alpose2d.cpp.

15.43.3.18 operator-() [1/2]

```
Pose2D AL::Math::Pose2D::operator- ( ) const [inline]
```

Overloading of operator - for Pose2D.

Definition at line 155 of file alpose2d.h.

15.43.3.19 operator-() [2/2]

```
Pose2D AL::Math::Pose2D::operator- (
            const Pose2D & pPos2 ) const [inline]
```

Overloading of operator - for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 139 of file alpose2d.h.

15.43.3.20 operator-=()

```
Pose2D & AL::Math::Pose2D::operator-= (
            const Pose2D & pPos2 )
```

Overloading of operator -= for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 70 of file alpose2d.cpp.

15.43.3.21 operator/()

```
Pose2D AL::Math::Pose2D::operator/ (
            float pVal ) const
```

Overloading of operator / for Pose2D.

Parameters

pVal	the float factor

Definition at line 100 of file alpose2d.cpp.

15.43.3.22 operator/=()

```
Pose2D & AL::Math::Pose2D::operator/= (
            float pVal )
```

Overloading of operator /= for Pose2D.

Parameters

pVal	the float factor

Definition at line 118 of file alpose2d.cpp.

15.43.3.23 operator==()

```
bool AL::Math::Pose2D::operator== (
            const Pose2D & pPos2 ) const
```

Overloading of operator == for Pose2D.

Parameters

pPos2	the second Pose2D

Definition at line 78 of file alpose2d.cpp.

15.43.3.24 toVector() [1/2]

```
void AL::Math::Pose2D::toVector (
            std::vector< float > & pReturnVector ) const
```

Return the Pose2D as a vector of float [x, y, theta].

Definition at line 134 of file alpose2d.cpp.

15.43.3.25 toVector() [2/2]

```
std::vector< float > AL::Math::Pose2D::toVector (
            void  ) const
```

Definition at line 142 of file alpose2d.cpp.

15.43.3.26 writeToVector()

```
void AL::Math::Pose2D::writeToVector (
            std::vector< float >::iterator & pIt ) const
```

Write [x, y, theta] in the vector and update the iterator. It is assumed the vector has enough space.

Definition at line 149 of file alpose2d.cpp.

15.43.4 Member Data Documentation

15.43.4.1 theta

```
float AL::Math::Pose2D::theta
```

Definition at line 31 of file alpose2d.h.

15.43.4.2 x

```
float AL::Math::Pose2D::x
```

Definition at line 27 of file alpose2d.h.

15.43.4.3 y

```
float AL::Math::Pose2D::y
```

Definition at line 29 of file alpose2d.h.

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

- depthnav/alpose2d.h
- depthnav/alpose2d.cpp

15.44 SingleLine Struct Reference

```
#include <LineStructure.hh>
```

Public Attributes

- double rho
- double theta
- double linePointX
- double linePointY
- double startPointX
- double startPointY
- double endPointX
- double endPointY
- double direction
- double gradientMagnitude
- double darkSideGrayValue
- double lightSideGrayValue
- double lineLength
- double width
- int numOfPixels
- std::vector< double > descriptor
- std::vector< unsigned char > bdescriptor

15.44.1 Detailed Description

Definition at line 13 of file LineStructure.hh.

15.44.2 Member Data Documentation

15.44.2.1 bdescriptor

```
std::vector<unsigned char> SingleLine::bdescriptor
```

Definition at line 42 of file LineStructure.hh.

15.44.2.2 darkSideGrayValue

```
double SingleLine::darkSideGrayValue
```

Definition at line 30 of file LineStructure.hh.

15.44.2.3 descriptor

```
std::vector<double> SingleLine::descriptor
```

Definition at line 40 of file LineStructure.hh.

15.44.2.4 direction

```
double SingleLine::direction
```

Definition at line 26 of file LineStructure.hh.

15.44.2.5 endPointX

```
double SingleLine::endPointX
```

Definition at line 23 of file LineStructure.hh.

15.44.2.6 endPointY

```
double SingleLine::endPointY
```

Definition at line 24 of file LineStructure.hh.

15.44.2.7 gradientMagnitude

```
double SingleLine::gradientMagnitude
```

Definition at line 28 of file LineStructure.hh.

15.44.2.8 lightSideGrayValue

```
double SingleLine::lightSideGrayValue
```

Definition at line 32 of file LineStructure.hh.

15.44.2.9 lineLength

```
double SingleLine::lineLength
```

Definition at line 34 of file LineStructure.hh.

15.44.2.10 linePointX

```
double SingleLine::linePointX
```

Definition at line 18 of file LineStructure.hh.

15.44.2.11 linePointY

```
double SingleLine::linePointY
```

Definition at line 19 of file LineStructure.hh.

15.44.2.12 numOfPixels

```
int SingleLine::numOfPixels
```

Definition at line 38 of file LineStructure.hh.

15.44.2.13 rho

```
double SingleLine::rho
```

Definition at line 16 of file LineStructure.hh.

15.44.2.14 startPointX

```
double SingleLine::startPointX
```

Definition at line 21 of file LineStructure.hh.

15.44.2.15 startPointY

```
double SingleLine::startPointY
```

Definition at line 22 of file LineStructure.hh.

15.44.2.16 theta

```
double SingleLine::theta
```

Definition at line 17 of file LineStructure.hh.

15.44.2.17 width

```
double SingleLine::width
```

Definition at line 36 of file LineStructure.hh.

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

- linenav/LineStructure.hh

15.45 tgraph::topmapprocessor Class Reference

The topmapprocessor class.

```
#include <topograph_processor.h>
```

Public Member Functions

- topmapprocessor ()

  topmapprocessor
- void setNavigationPtr (navigation ∗NAV)

  setNavigationPtr Set pointers for navgation
- int getweightofcurredge ()

  getweightofcurredge
- bool getobsavoiodflag ()

  getobsavoiodflag
- int getindexofcurredge ()

  getindexofcurredge location of the reference image in the edge that matches best with the current view
- int localizeintopomap (cv::Mat &cim, std::pair< int, int > &nod)

  localizeintopomap find the edge in the topological map correpoding to the current view of the robot
- void kimshow (kimRead ∗kf)

  kimshow show reference images in the list
- void process (char ∗imfold)

  process process topological garp
- int getbranchindx (int s, int e, char d)

  getbranchindx read edge
- void setpathkim (std::vector< int > optpath, kimRead ∗kf)

  setpathkim get reference image list of optimal path
- kimRead ∗ setpathkim (std::vector< int > optpath)

  setpathkim get reference image list of optimal path
- int getdirflag ()

  getdirflag

15.45.1 Detailed Description

The topmapprocessor class.

Definition at line 82 of file topograph_processor.h.

15.45.2 Constructor & Destructor Documentation

15.45.2.1 topmapprocessor()

```
tgraph::topmapprocessor::topmapprocessor ( )  [inline]
```

topmapprocessor

Definition at line 222 of file topograph_processor.h.

15.45.3 Member Function Documentation

15.45.3.1 getbranchindx()

```
int tgraph::topmapprocessor::getbranchindx (
             int s,
             int e,
             char d )  [inline]
```

getbranchindx read edge

Parameters

s	start node
e	end node
d	dir

Returns

Definition at line 365 of file topograph_processor.h.

15.45.3.2 getdirflag()

```
int tgraph::topmapprocessor::getdirflag ( )  [inline]
```

getdirflag

Returns

Definition at line 591 of file topograph_processor.h.

15.45.3.3 getindexofcurredge()

```
int tgraph::topmapprocessor::getindexofcurredge ( )  [inline]
```

getindexofcurredge location of the reference image in the edge that matches best with the current view

Returns

scaled position (to maintain same scale as edge weight(

Definition at line 271 of file topograph_processor.h.

15.45.3.4 getobsavoiodflag()

```
bool tgraph::topmapprocessor::getobsavoiodflag ( )  [inline]
```

getobsavoiodflag

Returns

true if obs avoid is used

Definition at line 262 of file topograph_processor.h.

15.45.3.5 getweightofcurredge()

```
int tgraph::topmapprocessor::getweightofcurredge ( )  [inline]
```

getweightofcurredge

Returns

scaled weight of current edge

Definition at line 253 of file topograph_processor.h.

15.45.3.6 kimshow()

```
void tgraph::topmapprocessor::kimshow (
             kimRead * kf )  [inline]
```

kimshow show reference images in the list

Parameters

pointer	to the reference image list

Definition at line 329 of file topograph_processor.h.

15.45.3.7 localizeintopomap()

```
int tgraph::topmapprocessor::localizeintopomap (
            cv::Mat & cim,
            std::pair< int, int > & nod ) [inline]
```

localizeintopomap find the edge in the topological map correpoding to the current view of the robot

Parameters

cim	current image
nod	current edge <startnode, endnode>

Returns

Definition at line 282 of file topograph_processor.h.

15.45.3.8 process()

```
void tgraph::topmapprocessor::process (
            char * imfold ) [inline]
```

process process topological garp

Parameters

imfold	folder where toplogical garph lies

Definition at line 350 of file topograph_processor.h.

15.45.3.9 setNavigationPtr()

```
void tgraph::topmapprocessor::setNavigationPtr (
            navigation * NAV ) [inline]
```

setNavigationPtr Set pointers for navgation

Parameters

NAV	

Definition at line 242 of file topograph_processor.h.

15.45.3.10 setpathkim() [1/2]

```
kimRead* tgraph::topmapprocessor::setpathkim (
             std::vector< int > optpath )  [inline]
```

setpathkim get reference image list of optimal path

Parameters

optpath	list of nodes in optimal path
kf	list of reference images

Definition at line 479 of file topograph_processor.h.

15.45.3.11 setpathkim() [2/2]

```
void tgraph::topmapprocessor::setpathkim (
             std::vector< int > optpath,
             kimRead * kf )  [inline]
```

setpathkim get reference image list of optimal path

Parameters

optpath	list of nodes in optimal path
kf	list of reference images

Definition at line 383 of file topograph_processor.h.

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

- navmain/topograph_processor.h

15.46 tgraph::topograph Struct Reference

The topograph struct.

```
#include <topograph_processor.h>
```

Public Attributes

- unsigned long nbranch
- std::string directionname
- unsigned int tag
- std::vector< branch > node

15.46.1 Detailed Description

The topograph struct.

Definition at line 70 of file topograph_processor.h.

15.46.2 Member Data Documentation

15.46.2.1 directionname

```
std::string tgraph::topograph::directionname
```

Definition at line 73 of file topograph_processor.h.

15.46.2.2 nbranch

```
unsigned long tgraph::topograph::nbranch
```

Definition at line 72 of file topograph_processor.h.

15.46.2.3 node

```
std::vector<branch> tgraph::topograph::node
```

Definition at line 75 of file topograph_processor.h.

15.46.2.4 tag

```
unsigned int tgraph::topograph::tag
```

Definition at line 74 of file topograph_processor.h.

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

- navmain/topograph_processor.h

15.47 vpControl Class Reference

```
#include <vpControl.hpp>
```

Public Member Functions

- vpControl (qi::SessionPtr session)

  vpControl starrt vpControl Service
- virtual ∼vpControl ()
- std::vector< float > getJointValues (std::vector< std::string > jointNames) const
- void setDesJointVelocity (std::vector< std::string > jointNames, std::vector< float > vel)
- void setOneDesJointVelocity (std::string jointName, float vel)
- void setTask ()
- qi::PeriodicTask::Callback printTime ()
- void applyJointVelocity ()
- void start ()
- void stopJoint ()
- void stop ()

15.47.1 Detailed Description

Definition at line 47 of file vpControl.hpp.

15.47.2 Constructor & Destructor Documentation

15.47.2.1 vpControl()

```
vpControl::vpControl (
            qi::SessionPtr session )
```

vpControl starrt vpControl Service

Parameters

session	pointer to the current session

Definition at line 54 of file vpControl.cpp.

15.47.2.2 ∼vpControl()

```
vpControl::∼vpControl ( )  [virtual]
```

Definition at line 65 of file vpControl.cpp.

15.47.3 Member Function Documentation

15.47.3.1 applyJointVelocity()

```
void vpControl::applyJointVelocity ( )
```

Definition at line 204 of file vpControl.cpp.

15.47.3.2 getJointValues()

```
std::vector< float > vpControl::getJointValues (
             std::vector< std::string > jointNames ) const
```

Definition at line 187 of file vpControl.cpp.

15.47.3.3 printTime()

```
qi::PeriodicTask::Callback vpControl::printTime ( )
```

Definition at line 194 of file vpControl.cpp.

15.47.3.4 setDesJointVelocity()

```
void vpControl::setDesJointVelocity (
             std::vector< std::string > jointNames,
             std::vector< float > vel )
```

Definition at line 104 of file vpControl.cpp.

15.47.3.5 setOneDesJointVelocity()

```
void vpControl::setOneDesJointVelocity (
             std::string jointName,
             float vel )
```

Definition at line 95 of file vpControl.cpp.

15.47.3.6 setTask()

```
void vpControl::setTask ( )
```

Definition at line 418 of file vpControl.cpp.

15.47.3.7 start()

```
void vpControl::start ( )
```

Definition at line 71 of file vpControl.cpp.

15.47.3.8 stop()

```
void vpControl::stop ( )
```

Definition at line 86 of file vpControl.cpp.

15.47.3.9 stopJoint()

```
void vpControl::stopJoint ( )
```

Definition at line 77 of file vpControl.cpp.

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

- pepper_qi/include/vpControl.hpp
- pepper_qi/src/vpControl.cpp

15.48 vpNaoqiGrabber Class Reference

```
#include <vpNaoqiGrabber.h>
```

Public Member Functions

- vpNaoqiGrabber (const qi::SessionPtr &session)

    vpNaoqiGrabber constructor for grabbing image
- virtual ∼vpNaoqiGrabber ()

    ∼vpNaoqiGrabber
- void acquire (cv::Mat &I)

    acquire acquire RBG image
- void acquire (cv::Mat &I, struct timeval &timestamp)
- void acquiredepth (cv::Mat &I)

    acquiredepth acquire depth image
- void acquiredepth (cv::Mat &I, struct timeval &timestamp)
- void acquirevoxel (cv::Mat &I)
- void cleanup ()
- std::string getCameraName ()
- unsigned int getWidth () const
- unsigned int getHeight () const
- qi::AnyObject getProxy () const
- void open ()

    open Start Camera
- void setCamera (const int &camera_id)

    setCamera id 0 => top RGB, 1=> buttom RGB, 2-6=> depth camera 2 => RawDepthColorSpace, 3 => DepthColorSpace, 4 => kDistanceColorSpace, 5 => XYZColorSpace, 6 => InfraredColorSpace. as defined in `http://doc.aldebaran.↩ com/2-5/family/pepper_technical/video_3D_pep.html`
- void setFramerate (int fps)
- void setCameraResolution (const int &resolution)
- bool setCameraParameter (const int &parameterId, const int &value)

Protected Attributes

- qi::AnyObject m_pVideo

    Video proxy.
- qi::AnyObject m_pMemory

    Memory proxy.
- std::string m_handle

    Handle Video proxy.
- int m_fps

    Requested frame per second.
- bool m_isOpen

    Proxy opened status.
- int m_width

    Image width.
- int m_height

    Image height.
- cv::Mat m_img

    Image data.
- std::string m_cameraName

    Camera name.
- int m_cameraId

    Camera identifier.
- int m_resolution

    Resolution camera.
- int m_colorspace

    Colorspace.

- int m_CV_imtype
- int m_colrspaceconvop
- std::string m_robotType

    Nao, Pepper or Romeo.
- bool m_pepper

    True if robot is Pepper.
- bool m_cameraMulti

15.48.1 Detailed Description

Definition at line 60 of file vpNaoqiGrabber.h.

15.48.2 Constructor & Destructor Documentation

15.48.2.1 vpNaoqiGrabber()

```
vpNaoqiGrabber::vpNaoqiGrabber (
             const qi::SessionPtr & session )
```

vpNaoqiGrabber constructor for grabbing image

Parameters

session	current session pointer

Default constructor tat set the default parameters as:

- camera framerate: 30 fps
- m_cameraId: 0

Definition at line 57 of file vpNaoqiGrabber.cpp.

15.48.2.2 ∼vpNaoqiGrabber()

```
vpNaoqiGrabber::∼vpNaoqiGrabber ( )  [virtual]
```

∼vpNaoqiGrabber

Destructor that call cleanup().

Definition at line 80 of file vpNaoqiGrabber.cpp.

15.48.3 Member Function Documentation

15.48.3.1 acquire() [1/2]

```
void vpNaoqiGrabber::acquire (
            cv::Mat & I )
```

acquire acquire RBG image

Parameters

I	image in cv::Mat

Definition at line 206 of file vpNaoqiGrabber.cpp.

15.48.3.2 acquire() [2/2]

```
void vpNaoqiGrabber::acquire (
            cv::Mat & I,
            struct timeval & timestamp )
```

Definition at line 219 of file vpNaoqiGrabber.cpp.

15.48.3.3 acquiredepth() [1/2]

```
void vpNaoqiGrabber::acquiredepth (
            cv::Mat & I )
```

acquiredepth acquire depth image

Parameters

I	image in cv::Mat

Definition at line 212 of file vpNaoqiGrabber.cpp.

15.48.3.4 acquiredepth() [2/2]

```
void vpNaoqiGrabber::acquiredepth (
            cv::Mat & I,
            struct timeval & timestamp )
```

Definition at line 275 of file vpNaoqiGrabber.cpp.

15.48.3.5 acquirevoxel()

```
void vpNaoqiGrabber::acquirevoxel (
            cv::Mat & I )
```

Definition at line 249 of file vpNaoqiGrabber.cpp.

15.48.3.6 cleanup()

```
void vpNaoqiGrabber::cleanup ( )
```

Definition at line 193 of file vpNaoqiGrabber.cpp.

15.48.3.7 getCameraName()

```
std::string vpNaoqiGrabber::getCameraName ( )  [inline]
```

Definition at line 154 of file vpNaoqiGrabber.h.

15.48.3.8 getHeight()

```
unsigned int vpNaoqiGrabber::getHeight ( ) const  [inline]
```

Returns

Image height.

Definition at line 167 of file vpNaoqiGrabber.h.

15.48.3.9 getProxy()

```
qi::AnyObject vpNaoqiGrabber::getProxy ( ) const  [inline]
```

Return the video device proxy used to grab images.

Definition at line 175 of file vpNaoqiGrabber.h.

15.48.3.10 getWidth()

```
unsigned int vpNaoqiGrabber::getWidth ( ) const  [inline]
```

Returns

Image width.

Definition at line 159 of file vpNaoqiGrabber.h.

15.48.3.11 open()

```
void vpNaoqiGrabber::open ( )
```

open Start Camera

Definition at line 145 of file vpNaoqiGrabber.cpp.

15.48.3.12 setCamera()

```
void vpNaoqiGrabber::setCamera (
            const int & camera_id )
```

setCamera id 0 => top RGB, 1=> buttom RGB, 2-6=> depth camera 2 => RawDepthColorSpace, 3 => DepthColorSpace, 4 => kDistanceColorSpace, 5 => XYZColorSpace, 6 => InfraredColorSpace. as defined in http://doc.aldebaran.↩ com/2-5/family/pepper_technical/video_3D_pep.html

Parameters

camera↩ _id	Select the camera to use.
camera↩ _id	: Camera identifier for Pepper : CameraTop(0), CameraBottom(1), CameraDepth(2)

Definition at line 90 of file vpNaoqiGrabber.cpp.

15.48.3.13 setCameraParameter()

```
bool vpNaoqiGrabber::setCameraParameter (
            const int & parameterId,
            const int & value )
```

Set a camera parameter.

Parameters

parameter←↩ Id	: Camera parameter requested.
value	: Value requested.

Returns

True if succesfull.

Definition at line 315 of file vpNaoqiGrabber.cpp.

15.48.3.14 setCameraResolution()

```
void vpNaoqiGrabber::setCameraResolution (
            const int & resolution )  [inline]
```

Set the camera resolution.

Parameters

resolution	: Index camera resolution.

See also

open()

Definition at line 214 of file vpNaoqiGrabber.h.

15.48.3.15 setFramerate()

```
void vpNaoqiGrabber::setFramerate (
            int fps )  [inline]
```

Set the camera framerate. In the constructor, the default framerate is set to 30 Hz.

Parameters

fps	: New framerate in Hz.

See also

open()

Definition at line 202 of file vpNaoqiGrabber.h.

15.48.4 Member Data Documentation

15.48.4.1 m_cameraId

```
int vpNaoqiGrabber::m_cameraId  [protected]
```

Camera identifier.

Definition at line 110 of file vpNaoqiGrabber.h.

15.48.4.2 m_cameraMulti

```
bool vpNaoqiGrabber::m_cameraMulti  [protected]
```

Definition at line 119 of file vpNaoqiGrabber.h.

15.48.4.3 m_cameraName

```
std::string vpNaoqiGrabber::m_cameraName  [protected]
```

Camera name.

Definition at line 109 of file vpNaoqiGrabber.h.

15.48.4.4 m_colorspace

```
int vpNaoqiGrabber::m_colorspace  [protected]
```

Colorspace.

Definition at line 112 of file vpNaoqiGrabber.h.

15.48.4.5 m_colrspaceconvop

```
int vpNaoqiGrabber::m_colrspaceconvop  [protected]
```

Definition at line 114 of file vpNaoqiGrabber.h.

15.48.4.6 m_CV_imtype

```
int vpNaoqiGrabber::m_CV_imtype  [protected]
```

Definition at line 113 of file vpNaoqiGrabber.h.

15.48.4.7 m_fps

```
int vpNaoqiGrabber::m_fps  [protected]
```

Requested frame per second.

Definition at line 104 of file vpNaoqiGrabber.h.

15.48.4.8 m_handle

```
std::string vpNaoqiGrabber::m_handle  [protected]
```

Handle Video proxy.

Definition at line 103 of file vpNaoqiGrabber.h.

15.48.4.9 m_height

```
int vpNaoqiGrabber::m_height  [protected]
```

Image height.

Definition at line 107 of file vpNaoqiGrabber.h.

15.48.4.10 m_img

```
cv::Mat vpNaoqiGrabber::m_img  [protected]
```

Image data.

Definition at line 108 of file vpNaoqiGrabber.h.

15.48.4.11 m_isOpen

```
bool vpNaoqiGrabber::m_isOpen  [protected]
```

Proxy opened status.

Definition at line 105 of file vpNaoqiGrabber.h.

15.48.4.12 m_pepper

```
bool vpNaoqiGrabber::m_pepper  [protected]
```

True if robot is Pepper.

Definition at line 116 of file vpNaoqiGrabber.h.

15.48.4.13 m_pMemory

```
qi::AnyObject vpNaoqiGrabber::m_pMemory  [protected]
```

Memory proxy.

Definition at line 102 of file vpNaoqiGrabber.h.

15.48.4.14 m_pVideo

```
qi::AnyObject vpNaoqiGrabber::m_pVideo  [protected]
```

Video proxy.

Definition at line 101 of file vpNaoqiGrabber.h.

15.48.4.15 m_resolution

```
int vpNaoqiGrabber::m_resolution  [protected]
```

Resolution camera.

Definition at line 111 of file vpNaoqiGrabber.h.

15.48.4.16 m_robotType

```
std::string vpNaoqiGrabber::m_robotType  [protected]
```

Nao, Pepper or Romeo.

Definition at line 115 of file vpNaoqiGrabber.h.

15.48.4.17 m_width

```
int vpNaoqiGrabber::m_width  [protected]
```

Image width.

Definition at line 106 of file vpNaoqiGrabber.h.

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

- pepper_qi/include/vpNaoqiGrabber.h
- pepper_qi/src/vpNaoqiGrabber.cpp

15.49 vpNaoqiRobot Class Reference

```
#include <vpNaoqiRobot.h>
```

Public Types

- enum RobotType { Pepper, Unknown }

Public Member Functions

- vpNaoqiRobot (const qi::SessionPtr &session)
- virtual ∼vpNaoqiRobot ()
- void cleanup ()
- std::vector< float > getAngles (const std::string &name, const bool &useSensors=true) const
- std::vector< float > getAngles (const std::vector< std::string > &name, const bool &useSensors=true) const
- std::vector< std::string > getBodyNames (const std::string &names) const
- std::vector< float > getPosition (const std::string &names, const bool &useSensors=true) const
- void getPosition (const std::vector< std::string > &names, std::vector< float > &q, const bool &useSensors=true) const
- qi::AnyObject ∗ getMotionProxy ()
- std::vector< std::vector< float > > getLimits (const std::string &name) const
- std::string getRobotName () const
- RobotType getRobotType () const
- void open ()

  open robot
- void moveTo (const float &x, const float &y, const float &theta) const

  moveTo move robot to the specified (x,y,theta) from current position
- bool rotate180 () const

  rotate180 rotate robot by 180

- void setCollisionProtection (bool protection)
- void setExternalCollisionProtectionEnabled (const std::string &name, const bool &enable) const
- void setPosition (const std::string &name, const float &angles, const float &fractionMaxSpeed) const
- void setPosition (const std::vector< std::string > &names, const std::vector< float > &jointPosition, const float &fractionMaxSpeed) const
- void setStiffness (const std::string &names, const float &stiffness) const
- void setStiffness (const std::vector< std::string > &names, const std::vector< float > &stiffness) const
- void setStiffness (const std::vector< std::string > &names, const float &stiffness) const
- void setVelocity (const std::vector< std::string > &names, const std::vector< float > &jointVel) const
- void getJointVelocity (const std::vector< std::string > &names, std::vector< float > &jointVel) const
- void setBaseVelocity (const std::vector< float > &jointVel) const

  setBaseVelocity set velocity of the base
- void setBaseVelocity (const float &vx, const float &vy, const float &wz) const
- void startPepperControl () const
- void stop (const std::string &name) const
- void stop (const std::vector< std::string > &names) const
- void stopPepperControl () const
- void stopBase () const

Protected Attributes

- qi::AnyObject m_pMemory

  Memory proxy.
- qi::AnyObject m_pMotion

  Motion proxy.
- qi::AnyObject m_pepper_control

  Proxy to Pepper_control.
- bool m_isOpen

  Proxy opened status.
- bool m_collisionProtection

  Collition protection enabling status.
- std::string m_robotName

  Name of the robot.
- RobotType m_robotType

  Indicate if the robot is Pepper.

15.49.1 Detailed Description

Definition at line 60 of file vpNaoqiRobot.h.

15.49.2 Member Enumeration Documentation

15.49.2.1 RobotType

```
enum vpNaoqiRobot::RobotType
```

Enumerator

Pepper	
Unknown	

Definition at line 64 of file vpNaoqiRobot.h.

15.49.3 Constructor & Destructor Documentation

15.49.3.1 vpNaoqiRobot()

```
vpNaoqiRobot::vpNaoqiRobot (
            const qi::SessionPtr & session )
```

Default constructor that set the default parameters as:

- robot ip address: "198.18.0.1"
- collision protection: enabled

Definition at line 58 of file vpNaoqiRobot.cpp.

15.49.3.2 ∼vpNaoqiRobot()

```
vpNaoqiRobot::∼vpNaoqiRobot ( )  [virtual]
```

Destructor that call cleanup().

Definition at line 81 of file vpNaoqiRobot.cpp.

15.49.4 Member Function Documentation

15.49.4.1 cleanup()

```
void vpNaoqiRobot::cleanup ( )
```

Destroy the connexion to the motion proxy.

Definition at line 133 of file vpNaoqiRobot.cpp.

15.49.4.2 getAngles() [1/2]

```
std::vector< float > vpNaoqiRobot::getAngles (
            const std::string & name,
            const bool & useSensors = true ) const
```

get joint angles

Get the value of all the joints of the chain.

Parameters

names	: Names the joints, chains, “Body”, “JointActuators”, “Joints” or “Actuators”.

Returns

The value of the joints.

Definition at line 456 of file vpNaoqiRobot.cpp.

15.49.4.3 getAngles() [2/2]

```
std::vector< float > vpNaoqiRobot::getAngles (
            const std::vector< std::string > & name,
            const bool & useSensors = true ) const
```

Get the value of all the joints in the vector.

Parameters

names	: Vector containing the names of the joints.

Returns

The value of the joints.

Definition at line 467 of file vpNaoqiRobot.cpp.

15.49.4.4 getBodyNames()

```
std::vector< std::string > vpNaoqiRobot::getBodyNames (
            const std::string & names ) const
```

get body names

Get the name of all the joints of the chain.

Parameters

names	: Names the joints, chains, "Body", "JointActuators", "Joints" or "Actuators".

Returns

The name of the joints.

Definition at line 482 of file vpNaoqiRobot.cpp.

15.49.4.5 getJointVelocity()

```
void vpNaoqiRobot::getJointVelocity (
            const std::vector< std::string > & names,
            std::vector< float > & jointVel ) const
```

Get the joints velocities.

Parameters

names	: Vector with the joint names.
names	: Vector to fill with the joint velocities.

Definition at line 586 of file vpNaoqiRobot.cpp.

15.49.4.6 getLimits()

```
std::vector< std::vector< float > > vpNaoqiRobot::getLimits (
            const std::string & name ) const
```

Get the minAngle (rad), maxAngle (rad), maxVelocity (rad.s-1) and maxTorque (N.m). for a given joint or actuator in the body.

Parameters

name	: Name of a joint, chain, “Body”, “JointActuators”, “Joints” or “Actuators”.

Returns

Vector containing the minAngle, maxAngle, maxVelocity and maxTorque for all the joints specified.

Definition at line 525 of file vpNaoqiRobot.cpp.

15.49.4.7 getMotionProxy()

```
qi::AnyObject * vpNaoqiRobot::getMotionProxy ( )
```

getMotionProxy

Get the motion proxy

Returns

pointer to the motion proxy

Definition at line 498 of file vpNaoqiRobot.cpp.

15.49.4.8 getPosition() [1/2]

```
std::vector<float> vpNaoqiRobot::getPosition (
            const std::string & names,
            const bool & useSensors = true ) const
```

get Poistions of different joints/ odeometry

15.49.4.9 getPosition() [2/2]

```
void vpNaoqiRobot::getPosition (
            const std::vector< std::string > & names,
            std::vector< float > & q,
            const bool & useSensors = true ) const
```

Get the position of all the joints in the vector.

Parameters

names	: Names the joints.
useSensors	: If true, sensor positions will be returned. If false, it will be the command.
q	: Joint position in radians.

Definition at line 513 of file vpNaoqiRobot.cpp.

15.49.4.10 getRobotName()

```
std::string vpNaoqiRobot::getRobotName ( ) const [inline]
```

get robot name and type=> supported Pepper, Nao, Romeo2

Definition at line 122 of file vpNaoqiRobot.h.

15.49.4.11 getRobotType()

```
RobotType vpNaoqiRobot::getRobotType ( ) const [inline]
```

Definition at line 124 of file vpNaoqiRobot.h.

15.49.4.12 moveTo()

```
void vpNaoqiRobot::moveTo (
            const float & x,
            const float & y,
            const float & theta ) const
```

moveTo move robot to the specified (x,y,theta) from current position

Parameters

x	
y	
theta	Apply a velocity vector to a vector of joints.Use just one call to apply the velocities.
names	: Names the joints, chains, "Body", "JointActuators", "Joints" or "Actuators".
jointVel	: Joint velocity vector with values expressed in rad/s (vpColVector).
verbose	: If true activates printings.

Apply a velocity vector to a vector of joints. Use just one call to apply the velocities.

Parameters

names	: Names the joints, chains, "Body", "JointActuators", "Joints" or "Actuators".
jointVel	: Joint velocity vector with values expressed in rad/s.
verbose	: If true activates printings.

Makes the robot move to the given pose in the ground plane, relative to FRAME_ROBOT. This is a blocking call.

Parameters

x	: Distance along the X axis in meters.
y	: Distance along the Y axis in meters.
theta	: Rotation around the Z axis in radians [-3.1415 to 3.1415]

Definition at line 349 of file vpNaoqiRobot.cpp.

15.49.4.13 open()

```
void vpNaoqiRobot::open ( )
```

open robot

Open the connection with the robot. All the parameters should be set before calling this function.

```
int main(int argc, char** argv)
{
  std::string opt_ip = "192.168.0.24";
    for (unsigned int i=0; i<argc; i++) {
      if (std::string(argv[i]) == "--ip")
        opt_ip = argv[i+1];
      else if (std::string(argv[i]) == "--help") {
        std::cout « "Usage: " « argv[0] « "[--ip <robot address>] " « std::endl;
        return 0;
      }
    }
  // Create a session to connect with the Robot
  qi::SessionPtr session = qi::makeSession();
  std::string ip_port = "tcp://" + opt_ip + ":9559";
  session->connect(ip_port);
  if (! opt_ip.empty()) {
    std::cout « "Connect to robot with ip address: " « opt_ip « std::endl;
  }
  vpNaoqiRobot robot(session);
  robot.open();
  return 0;
```

Definition at line 118 of file vpNaoqiRobot.cpp.

15.49.4.14 rotate180()

```
bool vpNaoqiRobot::rotate180 ( ) const
```

rotate180 rotate robot by 180

Returns

sucees or fail

Definition at line 355 of file vpNaoqiRobot.cpp.

15.49.4.15 setBaseVelocity() [1/2]

```
void vpNaoqiRobot::setBaseVelocity (
            const float & vx,
            const float & vy,
            const float & wz ) const
```

Apply a velocity Vx, Vy, Wz to Pepper.

Parameters

vel	: Joint velocity vector with values expressed in rad/s.

Definition at line 438 of file vpNaoqiRobot.cpp.

15.49.4.16 setBaseVelocity() [2/2]

```
void vpNaoqiRobot::setBaseVelocity (
            const std::vector< float > & jointVel ) const
```

setBaseVelocity set velocity of the base

Parameters

jointVel/	vx, vy,wz => translation velocities and roational velocities. Note: vy and wz can't be set together at a same time

Apply a velocity Vx, Vy, Wz to Pepper.

Parameters

vel	: Joint velocity vector with values expressed in rad/s.

Definition at line 419 of file vpNaoqiRobot.cpp.

15.49.4.17 setCollisionProtection()

```
void vpNaoqiRobot::setCollisionProtection (
            bool protection ) [inline]
```

Enable/disable the collision protection. In the constructor, the collision protection is enabled by default.

Parameters

protection	: true to enable collision protection, false to disable.

Definition at line 154 of file vpNaoqiRobot.h.

15.49.4.18 setExternalCollisionProtectionEnabled()

```
void vpNaoqiRobot::setExternalCollisionProtectionEnabled (
            const std::string & name,
            const bool & enable ) const
```

Set External collision

Parameters

name	: The name {“All”, “Move”, “Arms”, “LArm” or “RArm”}.
enable	Activate or deactivate the external collision of the desired name.

Definition at line 541 of file vpNaoqiRobot.cpp.

15.49.4.19 setPosition() `[1/2]`

```
void vpNaoqiRobot::setPosition (
            const std::string & name,
            const float & angle,
            const float & fractionMaxSpeed ) const
```

Set the position of all the joints of the chain.

Parameters

names	: Names the chain.
angles	: Joint positions in radians.
fractionMaxSpeed	: The fraction of maximum speed to use. Value should be comprised between 0 and 1.

Definition at line 554 of file vpNaoqiRobot.cpp.

15.49.4.20 setPosition() [2/2]

```
void vpNaoqiRobot::setPosition (
            const std::vector< std::string > & names,
            const std::vector< float > & jointPosition,
            const float & fractionMaxSpeed ) const
```

Set joint positions.

Parameters

names	: std::vector with the names the joints.
jointPosition	: Joint positions in radians.
fractionMaxSpeed	: The fraction of maximum speed to use. Value should be comprised between 0 and 1.

Definition at line 569 of file vpNaoqiRobot.cpp.

15.49.4.21 setStiffness() [1/3]

```
void vpNaoqiRobot::setStiffness (
            const std::string & names,
            const float & stiffness ) const
```

setStiffness of joints

Set the stiffness to a chain name, or to a specific joint.

Parameters

names	: Names of the chains, "Body", "JointActuators", "Joints" or "Actuators".
stiffness	: Stiffness parameter that should be between 0 (no stiffness) and 1 (full stiffness).

Definition at line 152 of file vpNaoqiRobot.cpp.

15.49.4.22 setStiffness() [2/3]

```
void vpNaoqiRobot::setStiffness (
            const std::vector< std::string > & names,
            const float & stiffness ) const
```

Set the stiffness of a list of joints.

Parameters

names	: Vector with the joint names.
stiffness	: Stiffness parameter that should be between 0 (no stiffness) and 1 (full stiffness).

Definition at line 175 of file vpNaoqiRobot.cpp.

15.49.4.23 setStiffness() [3/3]

```
void vpNaoqiRobot::setStiffness (
            const std::vector< std::string > & names,
            const std::vector< float > & stiffness ) const
```

Set the stiffness of a list of joints.

Parameters

names	: Vector with the joint names.
stiffness	: Stiffness parameters that should be between 0 (no stiffness) and 1 (full stiffness).

Definition at line 164 of file vpNaoqiRobot.cpp.

15.49.4.24 setVelocity()

```
void vpNaoqiRobot::setVelocity (
            const std::vector< std::string > & names,
            const std::vector< float > & jointVel ) const
```

Apply a velocity vector to a vector of joints.

Parameters

names	: Names the joints, chains, "Body", "JointActuators", "Joints" or "Actuators".
jointVel	: Joint velocity vector with values expressed in rad/s.
verbose	: If true activates printings.

Definition at line 196 of file vpNaoqiRobot.cpp.

15.49.4.25 startPepperControl()

```
void vpNaoqiRobot::startPepperControl ( ) const
```

stop Pepper

Start the service pepper_control.

Definition at line 393 of file vpNaoqiRobot.cpp.

15.49.4.26 stop() [1/2]

```
void vpNaoqiRobot::stop (
            const std::string & name ) const
```

Stop joint in a chain.

Parameters

names	: Chain or joint name.

Definition at line 376 of file vpNaoqiRobot.cpp.

15.49.4.27 stop() [2/2]

```
void vpNaoqiRobot::stop (
            const std::vector< std::string > & names ) const
```

Stop joints.

Parameters

names	: Vector with the joint names.

Definition at line 365 of file vpNaoqiRobot.cpp.

15.49.4.28 stopBase()

```
void vpNaoqiRobot::stopBase ( ) const
```

Stop the velocity of the base.

Definition at line 402 of file vpNaoqiRobot.cpp.

15.49.4.29 stopPepperControl()

```
void vpNaoqiRobot::stopPepperControl ( ) const
```

Stop the service pepper_control.

Definition at line 385 of file vpNaoqiRobot.cpp.

15.49.5 Member Data Documentation

15.49.5.1 m_collisionProtection

```
bool vpNaoqiRobot::m_collisionProtection  [protected]
```

Collition protection enabling status.

Definition at line 76 of file vpNaoqiRobot.h.

15.49.5.2 m_isOpen

```
bool vpNaoqiRobot::m_isOpen  [protected]
```

Proxy opened status.

Definition at line 75 of file vpNaoqiRobot.h.

15.49.5.3 m_pepper_control

```
qi::AnyObject vpNaoqiRobot::m_pepper_control  [protected]
```

Proxy to Pepper_control.

Definition at line 73 of file vpNaoqiRobot.h.

15.49.5.4 m_pMemory

```
qi::AnyObject vpNaoqiRobot::m_pMemory  [protected]
```

Memory proxy.

Definition at line 71 of file vpNaoqiRobot.h.

15.49.5.5 m_pMotion

```
qi::AnyObject vpNaoqiRobot::m_pMotion  [protected]
```

Motion proxy.

Definition at line 72 of file vpNaoqiRobot.h.

15.49.5.6 m_robotName

```
std::string vpNaoqiRobot::m_robotName  [protected]
```

Name of the robot.

Definition at line 77 of file vpNaoqiRobot.h.

15.49.5.7 m_robotType

```
RobotType vpNaoqiRobot::m_robotType  [protected]
```

Indicate if the robot is Pepper.

Definition at line 78 of file vpNaoqiRobot.h.

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

- pepper_qi/include/vpNaoqiRobot.h
- pepper_qi/src/vpNaoqiRobot.cpp

15.50 astar::weight_writer< WeightMap > Class Template Reference

```
#include <topograph_astar.h>
```

Public Member Functions

- weight_writer (WeightMap w)
- template<class Edge >
  void operator() (std::ostream &out, const Edge &e) const

15.50.1 Detailed Description

template<class WeightMap>
class astar::weight_writer< WeightMap >

Definition at line 75 of file topograph_astar.h.

15.50.2 Constructor & Destructor Documentation

15.50.2.1 weight_writer()

```
template<class WeightMap >
astar::weight_writer< WeightMap >::weight_writer (
            WeightMap w )  [inline]
```

Definition at line 77 of file topograph_astar.h.

15.50.3 Member Function Documentation

15.50.3.1 operator()()

```
template<class WeightMap >
template<class Edge >
void astar::weight_writer< WeightMap >::operator() (
            std::ostream & out,
            const Edge & e ) const  [inline]
```

Definition at line 79 of file topograph_astar.h.

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

- navmain/topograph_astar.h

Chapter 16

File Documentation

16.1 cmake/BIAS_CMakeLists.txt File Reference

16.2 cmake/libqgv_CMakeLists.txt File Reference

Functions

- find_package (Qt5 REQUIRED COMPONENTS Core Widgets Test) set(CMAKE_INCLUDE_CURRENT_DIR ON) SET(qgvlib_CPP qgv/private/QGVCore.cpp qgv/private/QGVGraphPrivate.cpp qgv/private/QGVEdgePrivate.cpp qgv/private/QGVGvcPrivate.cpp qgv/private/QGVNodePrivate.cpp qgv/QGVEdge.cpp qgv/QGVNode.cpp qgv/QG↩ VScene.cpp qgv/QGVSubGraph.cpp) INCLUDE_DIRECTORIES($
- qgv qgv private SET (QT_LIBRARIES Qt5::Core Qt5::Widgets Qt5::Test) ADD_LIBRARY(qgvcore SHARED $
- TARGET_LINK_LIBRARIES (qgvcore ${QT_LIBRARIES} ${GRAPHVIZ_GVC_LIBRARY} ${GRAPHVIZ_CGRAPH_↩ LIBRARY} ${GRAPHVIZ_CDT_LIBRARY}) SET(qgv_LIBS $

16.2.1 Function Documentation

16.2.1.1 find_package()

```
find_package (
            Qt5 REQUIRED COMPONENTS Core Widgets Test )
```

Definition at line 6 of file libqgv_CMakeLists.txt.

16.2.1.2 SET()

```
qgv qgv private SET (
            QT_LIBRARIES Qt5::Core Qt5::Widgets Qt5::Test  )
```

Definition at line 31 of file libqgv_CMakeLists.txt.

16.2.1.3 TARGET_LINK_LIBRARIES()

```
TARGET_LINK_LIBRARIES (
            qgvcore ${QT_LIBRARIES} ${GRAPHVIZ_GVC_LIBRARY} ${GRAPHVIZ_CGRAPH_LIBRARY} ${GRAPHVIZ_CDT↩
_LIBRARY}  )
```

Definition at line 42 of file libqgv_CMakeLists.txt.

16.3 CMakeLists.txt File Reference

Functions

- cmake_minimum_required (VERSION 3.0.0) project(PepperNavigation) set(CMAKE_PREFIX_PATH/home/suman/soft/third↩ _party/opencv/install/lib/cmake/opencv4/home/suman/soft/third_party/naoqi/install/share/naoqi_libqi/cmake/home/suman/soft/third↩ _party/naoqi/install/share/naoqi_libqicore/cmake) set(CMAKE_AUTOMOC ON) set(CMAKE_AUTOUIC ON) set(CM↩ AKE_INCLUDE_CURRENT_DIR ON) set(CMAKE_BUILD_TYPE RelWithDebInfo) option(USE_BIAS_LIBRARY "Use BIAS library for line matching if not OpenCV version is used" ON) option(USE_SYSTEM_ARPAK_SUPERLU "Use system Arpac
- blas and superlu OFF option (RUN_INSIDE_PEPPER "Run on board" OFF) if(RUN_INSIDE_PEPPER) set(USE_SY↩ STEM_ARPAK_SUPERLU 0) endif() if(USE_BIAS_LIBRARY) include($
- cmake BIAS_CMakeLists txt endif () if(NOT RUN_INSIDE_PEPPER) include($

Variables

- lapack

16.3.1 Function Documentation

16.3.1.1 cmake_minimum_required()

```
cmake_minimum_required (
            VERSION 3.0.  0 )
```

16.3.1.2 endif()

```
cmake libqgv_CMakeLists txt endif ( )
```

Definition at line 34 of file CMakeLists.txt.

16.3.1.3 option()

```
blas and superlu OFF option (
            RUN_INSIDE_PEPPER "Run on board" OFF )
```

Definition at line 25 of file CMakeLists.txt.

16.3.2 Variable Documentation

16.3.2.1 lapack

```
lapack
```

Definition at line 24 of file CMakeLists.txt.

16.4 depthnav/CMakeLists.txt File Reference

Functions

- cmake_minimum_required (VERSION 3.0) project(pepper_fsnav) set(CMAKE_PREFIX_PATH/home/suman/soft/thirdparty/Open↩ CV/install_lat/lib/cmake/opencv4/opt/ros/kinetic/share/naoqi_libqi/cmake/opt/ros/kinetic/share/naoqi_libqicore) set(C↩ MAKE_BUILD_TYPE "Relwithdebinfo") find_package(OpenCV 4 REQUIRED) find_package(naoqi_libqi) find_package(naoqi↩ _libqicore) find_package(Boost COMPONENTS filesystem system REQUIRED) include_directories(".") include_↩ directories(SYSTEM $

16.4.1 Function Documentation

16.4.1.1 cmake_minimum_required()

```
cmake_minimum_required (
            VERSION 3.   0 )
```

Definition at line 6 of file CMakeLists.txt.

16.5 pepper_qi/CMakeLists.txt File Reference

Functions

- cmake_minimum_required (VERSION 2.6.4 FATAL_ERROR) project(naoqi_ocv) set(CMAKE_BUILD_TYPE "Release" CACHE String "Choose the type of build

16.5.1 Function Documentation

16.5.1.1 cmake_minimum_required()

```
cmake_minimum_required (
            VERSION 2.6.4 FATAL_ERROR )
```

16.6 data/README.md File Reference

16.7 depthnav/README.md File Reference

16.8 linenav/README.md File Reference

16.9 mapping/README.md File Reference

16.10 navmain/maingui/README.md File Reference

16.11 navmain/README.md File Reference

16.12 pepper_qi/README.md File Reference

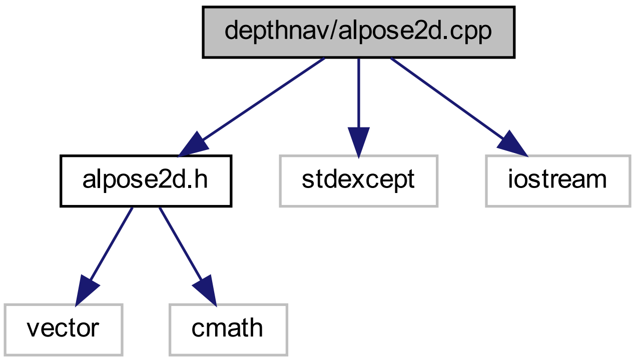
16.13 qgv/README.md File Reference

16.14 README.md File Reference

16.15 depthnav/alpose2d.cpp File Reference

```
#include "alpose2d.h"
#include <stdexcept>
#include <iostream>
```

Include dependency graph for alpose2d.cpp:



Namespaces

- AL
- AL::Math

Functions

- float AL::Math::distanceSquared (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the squared distance between two Pose2D.
- float AL::Math::distance (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the distance between two Pose2D.
- void AL::Math::pose2DInverse (const Pose2D &pPos, Pose2D &pRes)

  Compute the inverse of a Pose2D.
- void AL::Math::pose2dInvertInPlace (Pose2D &pPos)

  Inverse the given Pose2D in place:
- Pose2D AL::Math::pose2dDiff (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the Pose2D between the actual Pose2D and the one give in argument result:
- Pose2D AL::Math::pose2DInverse (const Pose2D &pPos)

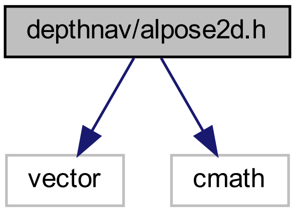
  Compute the inverse of a Pose2D.
- Pose2D AL::Math::pinv (const Pose2D &pPos)

  Alternative name for inverse: return the pose2d inverse of the given Pose2D.

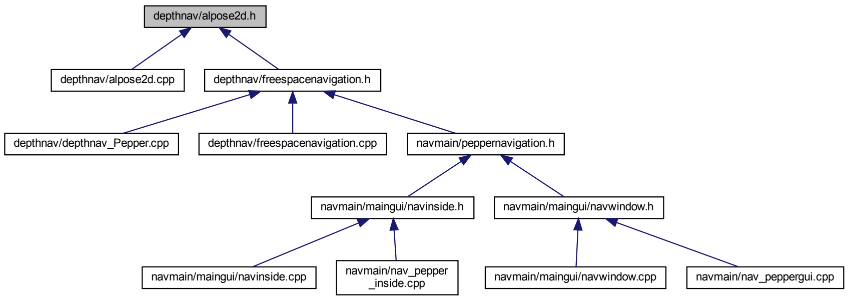
16.16 depthnav/alpose2d.h File Reference

```
#include <vector>
#include <cmath>
```

Include dependency graph for alpose2d.h:



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


depthnav/alpose2d.h
depthnav/alpose2d.cpp
depthnav/freespacenavigation.h
depthnav/depthnav_Pepper.cpp
depthnav/freespacenavigation.cpp
navmain/peppernavigation.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper_inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- struct AL::Math::Pose2D

  A pose in a 2-dimentional space.

Namespaces

- AL
- AL::Math

Macros

- #define _LIBALMATH_ALMATH_TYPES_ALPOSE2D_H_

Functions

- float AL::Math::distanceSquared (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the squared distance between two Pose2D.
- float AL::Math::distance (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the distance between two Pose2D.
- void AL::Math::pose2dInvertInPlace (Pose2D &pPos)

  Inverse the given Pose2D in place:
- Pose2D AL::Math::pinv (const Pose2D &pPos)

  Alternative name for inverse: return the pose2d inverse of the given Pose2D.
- Pose2D AL::Math::pose2dDiff (const Pose2D &pPos1, const Pose2D &pPos2)

  Compute the Pose2D between the actual Pose2D and the one give in argument result:
- Pose2D AL::Math::pose2DInverse (const Pose2D &pPos)

  Compute the inverse of a Pose2D.
- void AL::Math::pose2DInverse (const Pose2D &pPos, Pose2D &pRes)

  Compute the inverse of a Pose2D.

16.16.1 Macro Definition Documentation

16.16.1.1 _LIBALMATH_ALMATH_TYPES_ALPOSE2D_H_

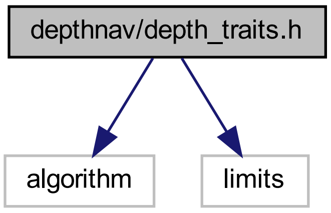
```
#define _LIBALMATH_ALMATH_TYPES_ALPOSE2D_H_
```

Definition at line 10 of file alpose2d.h.

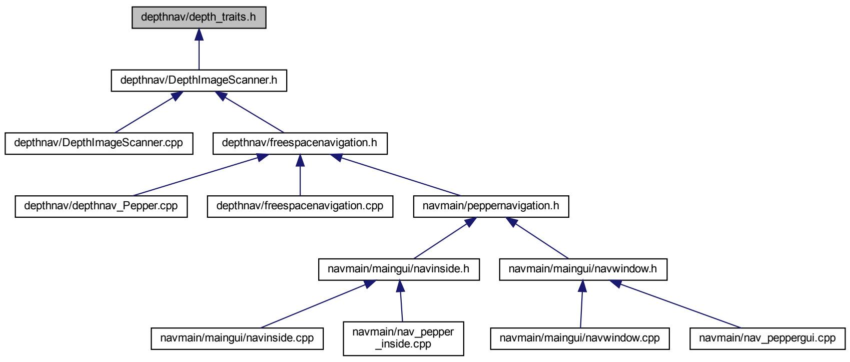
16.17 depthnav/depth_traits.h File Reference

```
#include <algorithm>
#include <limits>
```

Include dependency graph for depth_traits.h:



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


depthnav/depth_traits.h
depthnav/DepthImageScanner.h
depthnav/DepthImageScanner.cpp
depthnav/freespacenavigation.h
depthnav/depthnav_Pepper.cpp
depthnav/freespacenavigation.cpp
navmain/peppernavigation.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper_inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- struct depthimagescanner::DepthTraits< T >
- struct depthimagescanner::DepthTraits< uint16_t >
- struct depthimagescanner::DepthTraits< float >

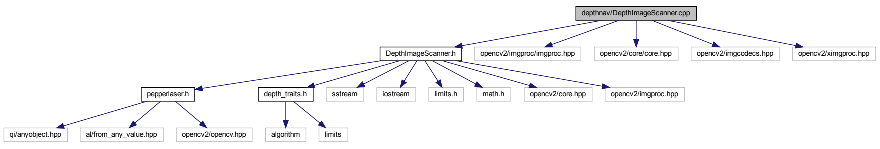
Namespaces

- depthimagescanner

16.18 depthnav/DepthImageScanner.cpp File Reference

```
#include "DepthImageScanner.h"
#include <opencv2/imgproc/imgproc.hpp>
#include <opencv2/core/core.hpp>
#include <opencv2/imgcodecs.hpp>
#include <opencv2/ximgproc.hpp>
```

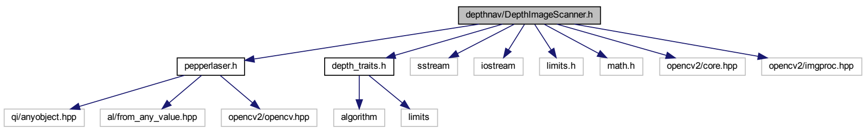
Include dependency graph for DepthImageScanner.cpp:



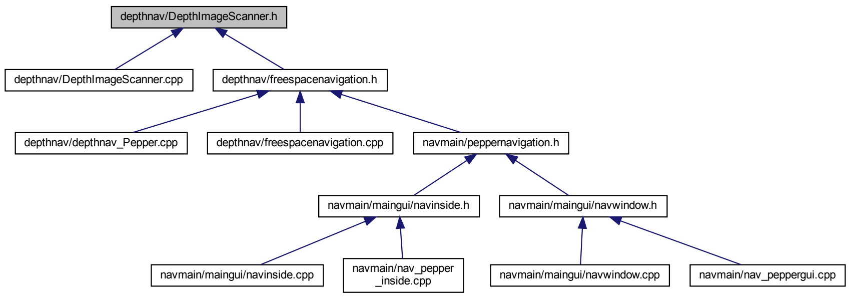
16.19 depthnav/DepthImageScanner.h File Reference

```
#include "pepperlaser.h"
#include "depth_traits.h"
#include <sstream>
#include <iostream>
#include <limits.h>
#include <math.h>
#include <opencv2/core.hpp>
#include <opencv2/imgproc.hpp>
```

Include dependency graph for DepthImageScanner.h:



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


depthnav/DepthImageScanner.h
depthnav/DepthImageScanner.cpp
depthnav/freespacenavigation.h
depthnav/depthnav_Pepper.cpp
depthnav/freespacenavigation.cpp
navmain/peppernavigation.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper_inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- class depthimagescanner::DepthImageScanner

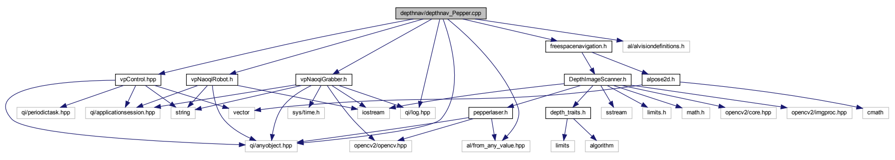
Namespaces

- depthimagescanner

16.20 depthnav/depthnav_Pepper.cpp File Reference

```
#include "vpNaoqiRobot.h"
#include "vpNaoqiGrabber.h"
#include "vpControl.hpp"
#include <al/alvisiondefinitions.h>
#include <al/from_any_value.hpp>
#include <qi/anyobject.hpp>
#include <qi/log.hpp>
#include "freespacenavigation.h"
```

Include dependency graph for depthnav_Pepper.cpp:



Classes

- class MyService

Functions

- QI_REGISTER_MT_OBJECT (MyService, myCallback, myCallback2, myCallback1)
- cv::Mat getPepperRT ()
- void processdepth (cv::Mat &Id, cv::Mat &K)
- int main (int argc, char $**$argv)

Variables

- bool eventraised
- vpNaoqiRobot $*$ robo

16.20.1 Function Documentation

16.20.1.1 getPepperRT()

```
cv::Mat getPepperRT ( )
```

Definition at line 123 of file depthnav_Pepper.cpp.

16.20.1.2 main()

```
int main (
            int argc,
            char ** argv )
```

Definition at line 175 of file depthnav_Pepper.cpp.

16.20.1.3 processdepth()

```
void processdepth (
            cv::Mat & Id,
            cv::Mat & K )
```

Definition at line 160 of file depthnav_Pepper.cpp.

16.20.1.4 QI_REGISTER_MT_OBJECT()

```
QI_REGISTER_MT_OBJECT (
            MyService ,
            myCallback ,
            myCallback2 ,
            myCallback1  )
```

16.20.2 Variable Documentation

16.20.2.1 eventraised

```
bool eventraised
```

Definition at line 13 of file depthnav_Pepper.cpp.

16.20.2.2 robo

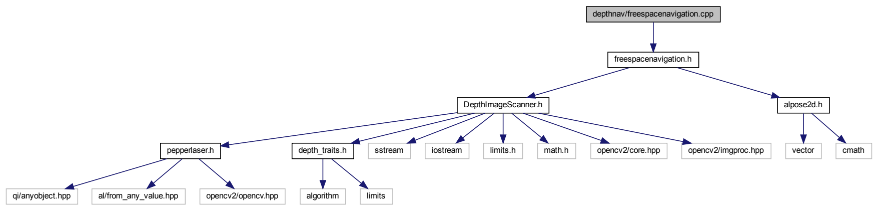
```
vpNaoqiRobot* robo
```

Definition at line 14 of file depthnav_Pepper.cpp.

16.21 depthnav/freespacenavigation.cpp File Reference

```
#include "freespacenavigation.h"
```

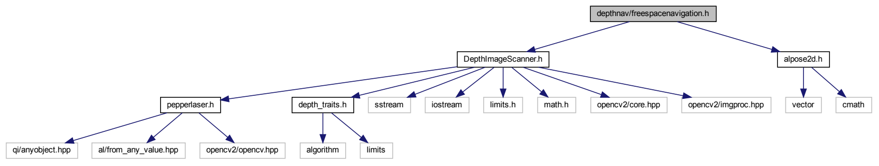
Include dependency graph for freespacenavigation.cpp:



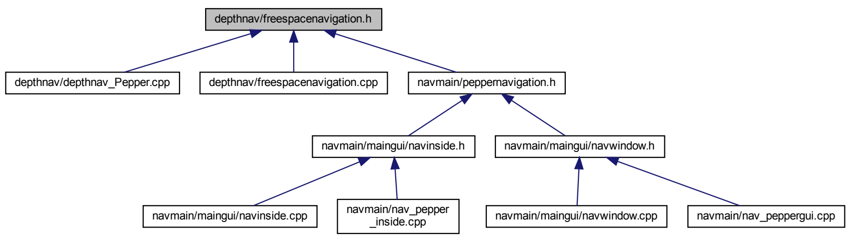
16.22 depthnav/freespacenavigation.h File Reference

```
#include "DepthImageScanner.h"
#include "alpose2d.h"
```

Include dependency graph for freespacenavigation.h:



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


depthnav/freespacenavigation.h
depthnav/depthnav_Pepper.cpp
depthnav/freespacenavigation.cpp
navmain/peppernavigation.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper_inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

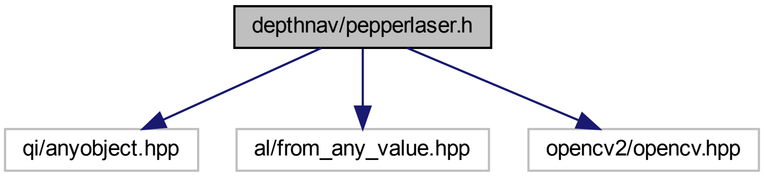
Classes

- class freespacenavigation

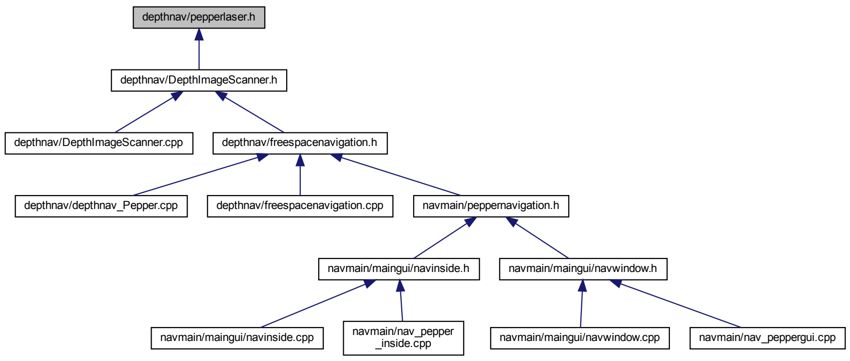
16.23 depthnav/pepperlaser.h File Reference

```
#include <qi/anyobject.hpp>
#include <al/from_any_value.hpp>
#include <opencv2/opencv.hpp>
```

Include dependency graph for pepperlaser.h:



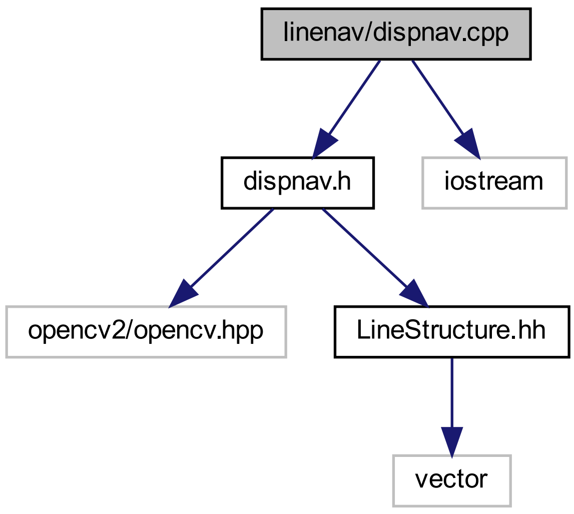
This graph shows which files directly or indirectly include this file:


depthnav/pepperlaser.h
depthnav/DepthImageScanner.h
depthnav/DepthImageScanner.cpp
depthnav/freespacenavigation.h
depthnav/depthnav_Pepper.cpp
depthnav/freespacenavigation.cpp
navmain/peppernavigation.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper _inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

16.24 linenav/dispnav.cpp File Reference

```
#include "dispnav.h"
#include <iostream>
```

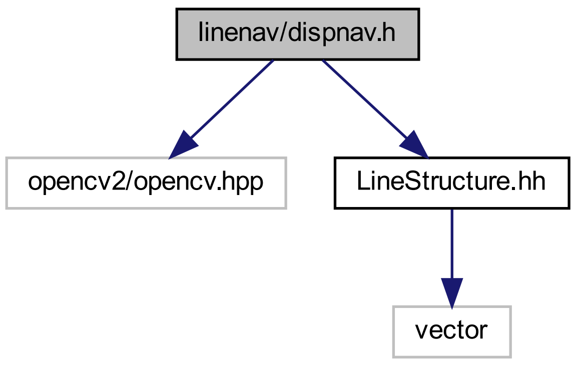
Include dependency graph for dispnav.cpp:



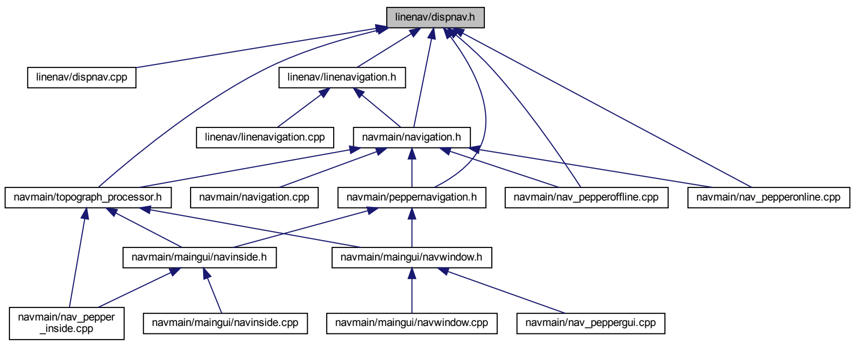
16.25 linenav/dispnav.h File Reference

```
#include <opencv2/opencv.hpp>
#include "LineStructure.hh"
```

Include dependency graph for dispnav.h:



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


linenav/dispnav.h
linenav/dispnav.cpp
linenav/linenavigation.h
linenav/linenavigation.cpp
navmain/navigation.h
navmain/topograph_processor.h
navmain/navigation.cpp
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper_inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

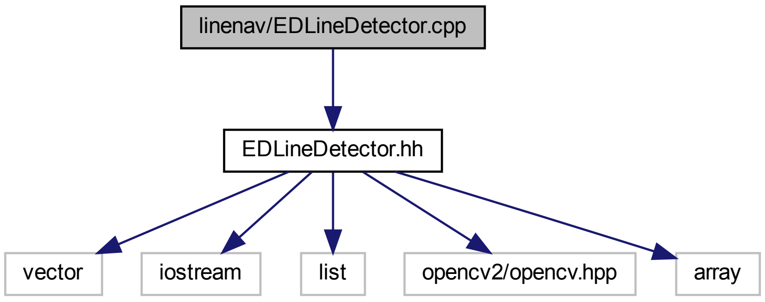
Classes

- class dispNav

  The dispNav class.

16.26 linenav/EDLineDetector.cpp File Reference

```
#include "EDLineDetector.hh"
```
Include dependency graph for EDLineDetector.cpp:



Macros

- #define Horizontal 255
- #define Vertical 0
- #define UpDir 1
- #define RightDir 2
- #define DownDir 3
- #define LeftDir 4
- #define TryTime 6
- #define SkipEdgePoint 2

Functions

- void writeMat (cv::Mat m, std::string name, int n)

16.26.1 Macro Definition Documentation

16.26.1.1 DownDir

```
#define DownDir 3
```

Definition at line 51 of file EDLineDetector.cpp.

16.26.1.2 Horizontal

```
#define Horizontal 255
```

Definition at line 47 of file EDLineDetector.cpp.

16.26.1.3 LeftDir

```
#define LeftDir 4
```

Definition at line 52 of file EDLineDetector.cpp.

16.26.1.4 RightDir

```
#define RightDir 2
```

Definition at line 50 of file EDLineDetector.cpp.

16.26.1.5 SkipEdgePoint

```
#define SkipEdgePoint 2
```

Definition at line 54 of file EDLineDetector.cpp.

16.26.1.6 TryTime

```
#define TryTime 6
```

Definition at line 53 of file EDLineDetector.cpp.

16.26.1.7 UpDir

```
#define UpDir 1
```

Definition at line 49 of file EDLineDetector.cpp.

16.26.1.8 Vertical

```
#define Vertical 0
```

Definition at line 48 of file EDLineDetector.cpp.

16.26.2 Function Documentation

16.26.2.1 writeMat()

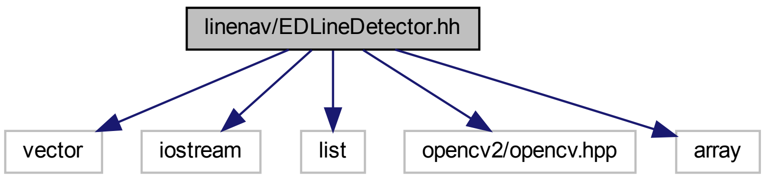
```
void writeMat (
             cv::Mat m,
             std::string name,
             int n )
```

Definition at line 124 of file EDLineDetector.cpp.

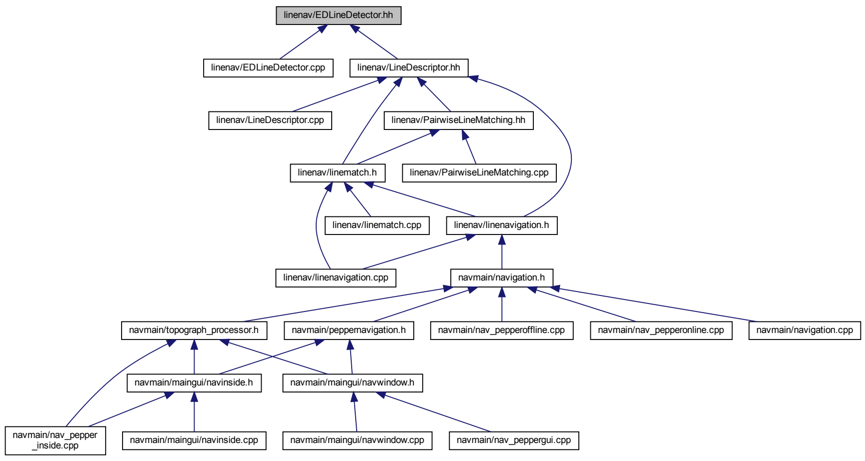
16.27 linenav/EDLineDetector.hh File Reference

```
#include <vector>
#include <iostream>
#include <list>
#include <opencv2/opencv.hpp>
#include <array>
```

Include dependency graph for EDLineDetector.hh:



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


linenav/EDLineDetector.hh
linenav/EDLineDetector.cpp
linenav/LineDescriptor.hh
linenav/LineDescriptor.cpp
linenav/PairwiseLineMatching.hh
linenav/linematch.h
linenav/PairwiseLineMatching.cpp
linenav/linematch.cpp
linenav/linenavigation.h
linenav/linenavigation.cpp
navmain/navigation.h
navmain/topograph_processor.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/navigation.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper_inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- struct Pixel
- struct EdgeChains
- struct LineChains
- struct EDLineParam
- class EDLineDetector

Macros

- #define RELATIVE_ERROR_FACTOR 100.0
- #define M_LN10 2.30258509299404568402
- #define log_gamma(x) ((x)>15.0?log_gamma_windschitl(x):log_gamma_lanczos(x))

Typedefs

- typedef std::list< Pixel > PixelChain

16.27.1 Macro Definition Documentation

16.27.1.1 log_gamma

```
#define log_gamma(
             x ) ((x)>15.0?log_gamma_windschitl(x):log_gamma_lanczos(x))
```

Definition at line 86 of file EDLineDetector.hh.

16.27.1.2 M_LN10

```
#define M_LN10 2.30258509299404568402
```

Definition at line 85 of file EDLineDetector.hh.

16.27.1.3 RELATIVE_ERROR_FACTOR

```
#define RELATIVE_ERROR_FACTOR 100.0
```

Definition at line 84 of file EDLineDetector.hh.

16.27.2 Typedef Documentation

16.27.2.1 PixelChain

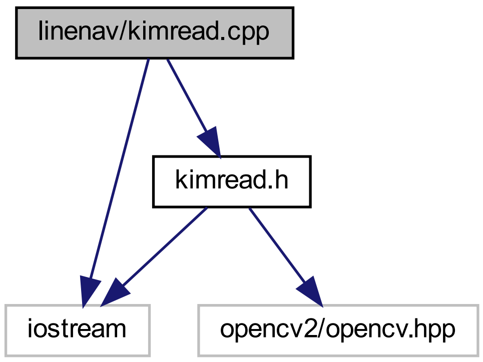
```
typedef std::list<Pixel> PixelChain
```

Definition at line 71 of file EDLineDetector.hh.

16.28 linenav/kimread.cpp File Reference

```
#include "kimread.h"
#include <iostream>
```

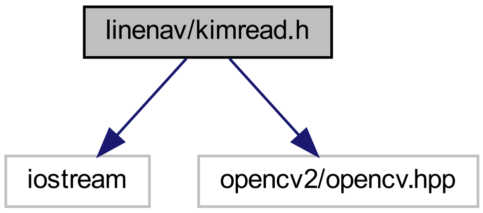
Include dependency graph for kimread.cpp:



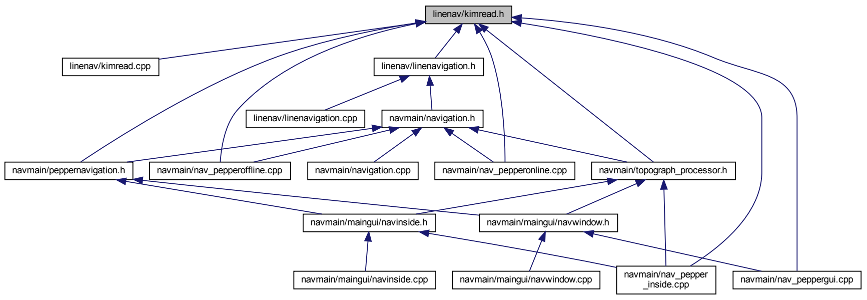
16.29 linenav/kimread.h File Reference

```
#include <iostream>
#include <opencv2/opencv.hpp>
```

Include dependency graph for kimread.h:



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


linenav/kimread.h
linenav/kimread.cpp
linenav/linenavigation.h
linenav/linenavigation.cpp
navmain/navigation.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/navigation.cpp
navmain/nav_pepperonline.cpp
navmain/topograph_processor.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_pepper _inside.cpp
navmain/nav_peppergui.cpp

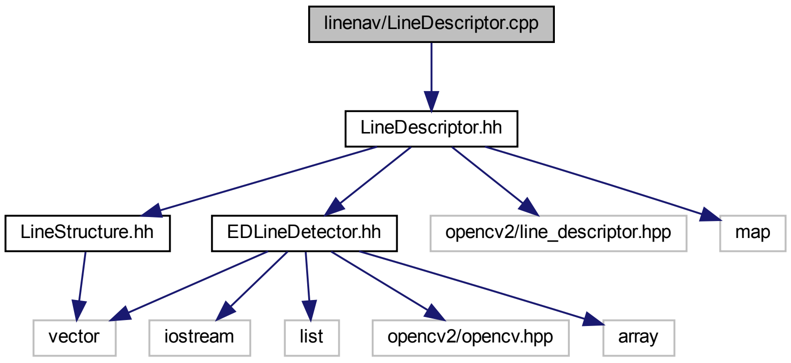
Classes

- class kimRead

16.30 linenav/LineDescriptor.cpp File Reference

```
#include "LineDescriptor.hh"
```

Include dependency graph for LineDescriptor.cpp:



Macros

- #define SalienceScale 0.9
- #define NO_OF_OCTAVES 1

16.30.1 Macro Definition Documentation

16.30.1.1 NO_OF_OCTAVES

```
#define NO_OF_OCTAVES 1
```

Definition at line 15 of file LineDescriptor.cpp.

16.30.1.2 SalienceScale

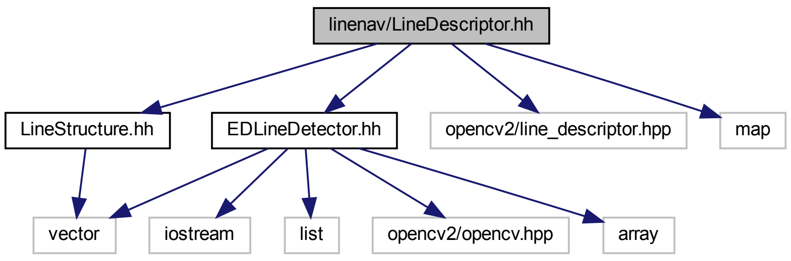
```
#define SalienceScale 0.9
```

Definition at line 14 of file LineDescriptor.cpp.

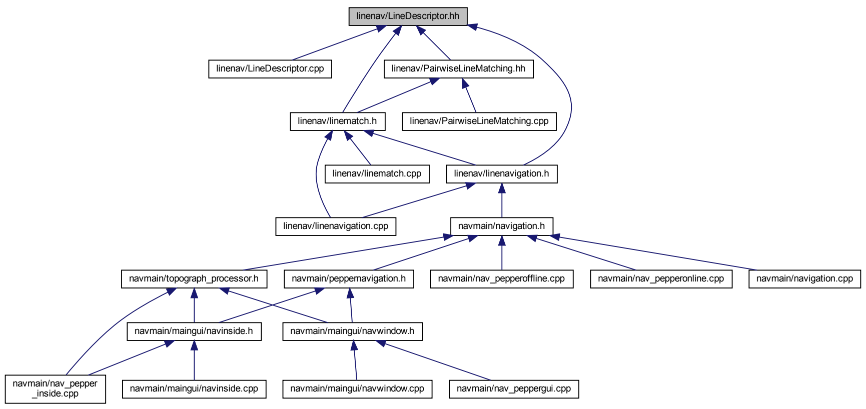
16.31 linenav/LineDescriptor.hh File Reference

```
#include "EDLineDetector.hh"
#include "LineStructure.hh"
#include <opencv2/line_descriptor.hpp>
#include <map>
```

Include dependency graph for LineDescriptor.hh:



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


linenav/LineDescriptor.hh
linenav/LineDescriptor.cpp
linenav/PairwiseLineMatching.hh
linenav/linematch.h
linenav/PairwiseLineMatching.cpp
linenav/linematch.cpp
linenav/linenavigation.h
linenav/linenavigation.cpp
navmain/navigation.h
navmain/topograph_processor.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/navigation.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper_inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

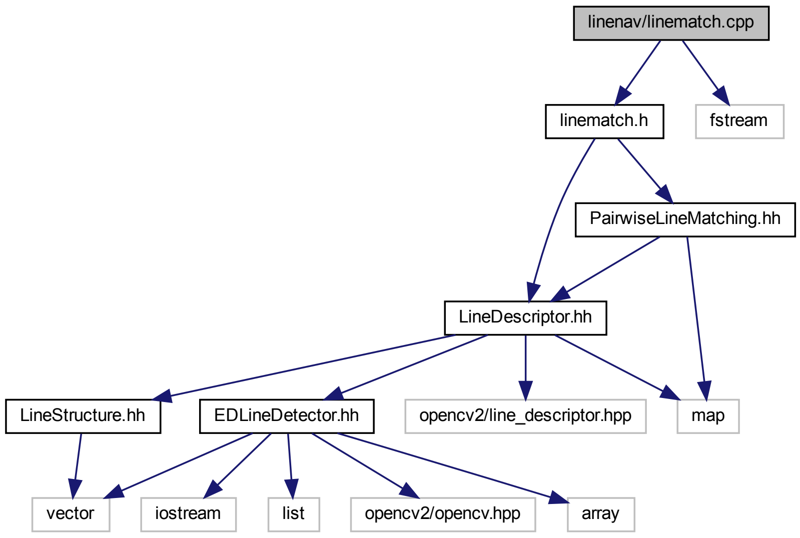
Classes

- struct OctaveLine
- class LineDescriptor

16.32 linenav/linematch.cpp File Reference

```
#include "linematch.h"
#include <fstream>
```

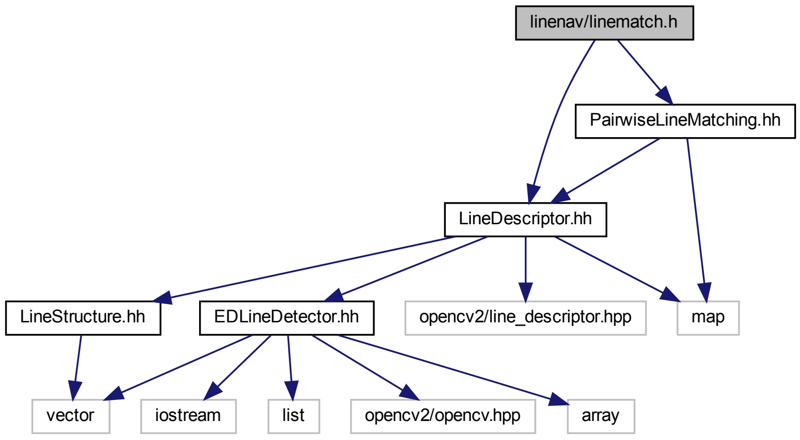
Include dependency graph for linematch.cpp:



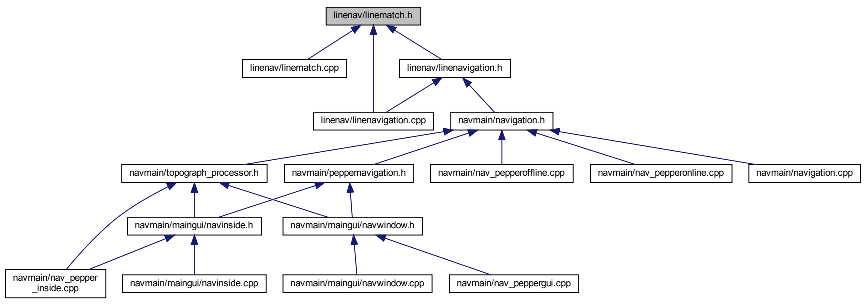
16.33 linenav/linematch.h File Reference

```
#include "LineDescriptor.hh"
#include "PairwiseLineMatching.hh"
```

Include dependency graph for linematch.h:



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


linenav/linematch.h
linenav/linematch.cpp
linenav/linenavigation.h
linenav/linenavigation.cpp
navmain/navigation.h
navmain/topograph_processor.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/navigation.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper _inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

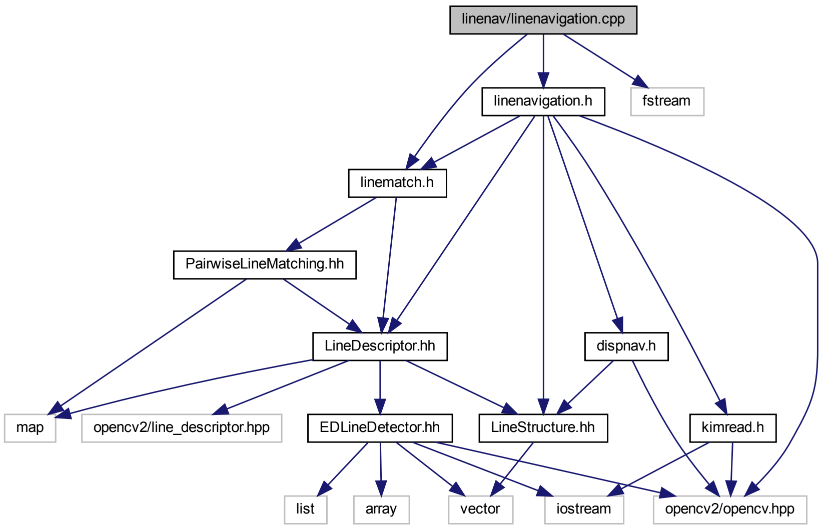
Classes

- class linematch

16.34 linenav/linenavigation.cpp File Reference

```
#include "linenavigation.h"
#include "linematch.h"
#include <fstream>
```

Include dependency graph for linenavigation.cpp:

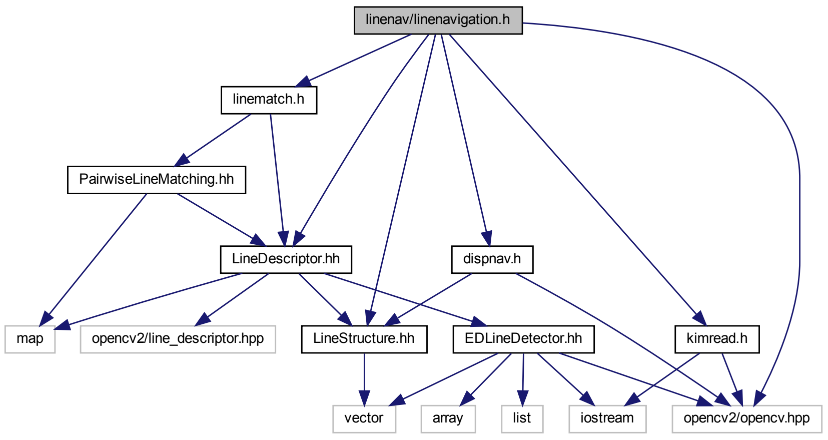


16.35 linenav/linenavigation.h File Reference

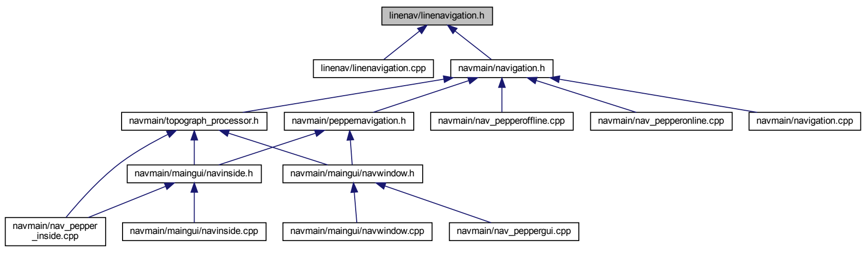
```
#include "LineStructure.hh"
#include "LineDescriptor.hh"
#include "linematch.h"
#include <opencv2/opencv.hpp>
```

```
#include "kimread.h"
#include "dispnav.h"
```

Include dependency graph for linenavigation.h:



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


linenav/linenavigation.h
linenav/linenavigation.cpp
navmain/navigation.h
navmain/topograph_processor.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/navigation.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper _inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

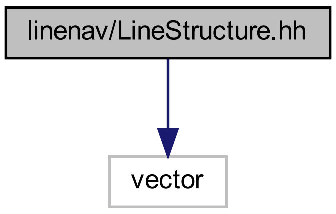
Classes

- class linenavigation

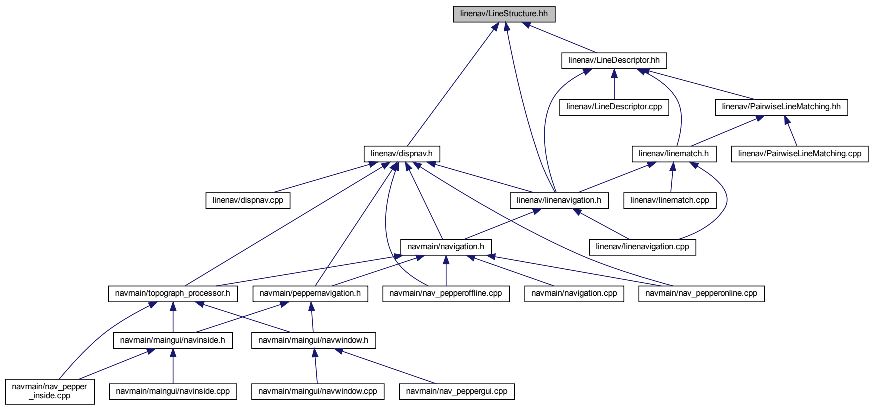
16.36 linenav/LineStructure.hh File Reference

```
#include <vector>
```

Include dependency graph for LineStructure.hh:



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


linenav/LineStructure.hh
linenav/LineDescriptor.hh
linenav/LineDescriptor.cpp
linenav/PairwiseLineMatching.hh
linenav/dispnav.h
linenav/linematch.h
linenav/PairwiseLineMatching.cpp
linenav/dispnav.cpp
linenav/linenavigation.h
linenav/linematch.cpp
navmain/navigation.h
linenav/linenavigation.cpp
navmain/topograph_processor.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/navigation.cpp
navmain/nav_pepperonline.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper _inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- struct SingleLine
- struct OctaveSingleLine

Typedefs

- typedef std::vector< SingleLine > Lines_list
- typedef std::vector< OctaveSingleLine > LinesVec
- typedef std::vector< LinesVec > ScaleLines

16.36.1 Typedef Documentation

16.36.1.1 Lines_list

```
typedef std::vector<SingleLine> Lines_list
```

Definition at line 46 of file LineStructure.hh.

16.36.1.2 LinesVec

```
typedef std::vector<OctaveSingleLine> LinesVec
```

Definition at line 78 of file LineStructure.hh.

16.36.1.3 ScaleLines

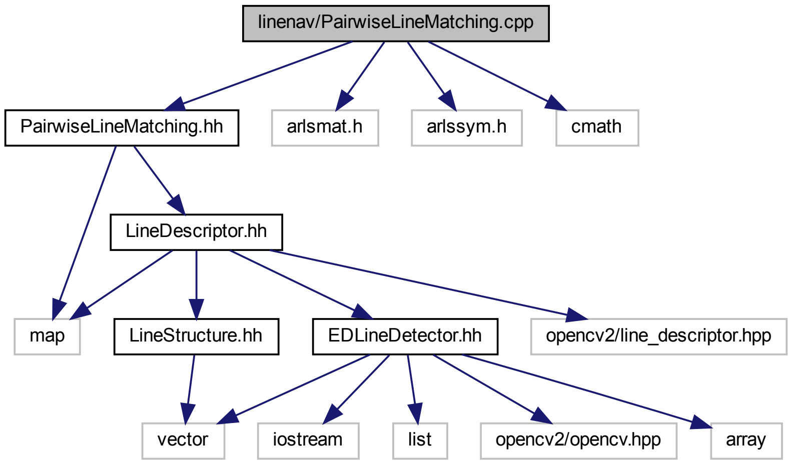
```
typedef std::vector<LinesVec> ScaleLines
```

Definition at line 80 of file LineStructure.hh.

16.37 linenav/PairwiseLineMatching.cpp File Reference

```
#include "PairwiseLineMatching.hh"
#include "arlsmat.h"
#include "arlssym.h"
#include <cmath>
```

Include dependency graph for PairwiseLineMatching.cpp:



Macros

- #define Inf 1e10
- #define ResolutionScale 20
- #define AcceptableAngleHistogramDifference 0.49
- #define AcceptableLengthVectorDifference 0.4
- #define LengthDifThreshold 4
- #define AngleDifferenceThreshold 0.7854
- #define DescriptorDifThreshold 0.35
- #define RelativeAngleDifferenceThreshold 0.7854
- #define IntersectionRationDifThreshold 1
- #define ProjectionRationDifThreshold 1
- #define WeightOfMeanEigenVec 0.1

Functions

- void normalize (std::vector< double > &vect)
- double normL2 (std::vector< double > &vect)

16.37.1 Macro Definition Documentation

16.37.1.1 AcceptableAngleHistogramDifference

```
#define AcceptableAngleHistogramDifference 0.49
```

Definition at line 21 of file PairwiseLineMatching.cpp.

16.37.1.2 AcceptableLengthVectorDifference

```
#define AcceptableLengthVectorDifference 0.4
```

Definition at line 22 of file PairwiseLineMatching.cpp.

16.37.1.3 AngleDifferenceThreshold

```
#define AngleDifferenceThreshold 0.7854
```

Definition at line 29 of file PairwiseLineMatching.cpp.

16.37.1.4 DescriptorDifThreshold

```
#define DescriptorDifThreshold 0.35
```

Definition at line 30 of file PairwiseLineMatching.cpp.

16.37.1.5 Inf

```
#define Inf 1e10
```

Definition at line 15 of file PairwiseLineMatching.cpp.

16.37.1.6 IntersectionRationDifThreshold

```
#define IntersectionRationDifThreshold 1
```

Definition at line 35 of file PairwiseLineMatching.cpp.

16.37.1.7 LengthDifThreshold

```
#define LengthDifThreshold 4
```

Definition at line 28 of file PairwiseLineMatching.cpp.

16.37.1.8 ProjectionRationDifThreshold

```
#define ProjectionRationDifThreshold 1
```

Definition at line 36 of file PairwiseLineMatching.cpp.

16.37.1.9 RelativeAngleDifferenceThreshold

```
#define RelativeAngleDifferenceThreshold 0.7854
```

Definition at line 34 of file PairwiseLineMatching.cpp.

16.37.1.10 ResolutionScale

```
#define ResolutionScale 20
```

Definition at line 17 of file PairwiseLineMatching.cpp.

16.37.1.11 WeightOfMeanEigenVec

```
#define WeightOfMeanEigenVec 0.1
```

Definition at line 40 of file PairwiseLineMatching.cpp.

16.37.2 Function Documentation

16.37.2.1 normalize()

```
void normalize (
            std::vector< double > & vect )  [inline]
```

Definition at line 41 of file PairwiseLineMatching.cpp.

16.37.2.2 normL2()

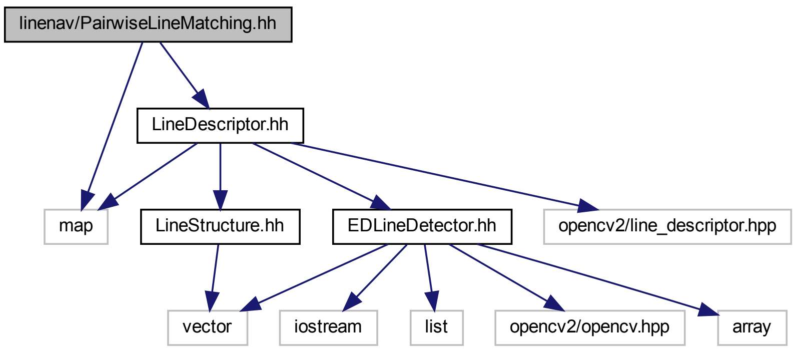
```
double normL2 (
            std::vector< double > & vect )  [inline]
```

Definition at line 52 of file PairwiseLineMatching.cpp.

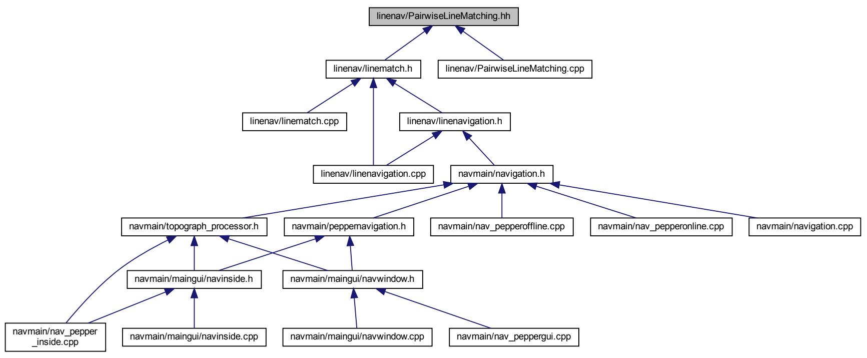
16.38 linenav/PairwiseLineMatching.hh File Reference

```
#include <map>
#include "LineDescriptor.hh"
```

Include dependency graph for PairwiseLineMatching.hh:



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


linenav/PairwiseLineMatching.hh
linenav/linematch.h
linenav/PairwiseLineMatching.cpp
linenav/linematch.cpp
linenav/linenavigation.h
linenav/linenavigation.cpp
navmain/navigation.h
navmain/topograph_processor.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/navigation.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper_inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- struct Node
- struct CompareL
- struct CompareS
- class Matrix< T >
- class PairwiseLineMatching

Typedefs

- typedef std::vector< Node > Nodes_list
- typedef std::multimap< double, unsigned int, CompareL > EigenMAP
- typedef std::multimap< double, unsigned int, CompareS > DISMAP

16.38.1 Typedef Documentation

16.38.1.1 DISMAP

```
typedef std::multimap<double,unsigned int,CompareS> DISMAP
```

Definition at line 35 of file PairwiseLineMatching.hh.

16.38.1.2 EigenMAP

```
typedef std::multimap<double,unsigned int,CompareL> EigenMAP
```

Definition at line 30 of file PairwiseLineMatching.hh.

16.38.1.3 Nodes_list

```
typedef std::vector<Node> Nodes_list
```

Definition at line 24 of file PairwiseLineMatching.hh.

16.39 mapping/generate_configfile.m File Reference

Functions

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- % % % add line matching lib path addpath ('./linematching')
- fprintf (fileID,'% s % 2s\n', nodesname')
- fprintf (fileID,'% s % s % s\n', edges')
- fprintf (fileID,'% s \n', hd3)

- if (s< 7 &&d=='c') fold
- elseif (s< 7 &&d=='a') fold = ['Edge_',num2str(e),num2str(e-1)]
- if (dr=='s') kim = indd+1
- elseif (dr=='e') kim
- if (l==1) flagx=0
- elseif ((l==L)||(linect(l-1) > linect(l+1))) flagx
- elseif (linect(l-1)<=linect(l+1)) flagx=0
- end if (flagx==1) indd
- elseif (flagx==0) indd
- end matches (i)
- end branch (:, end)
- fprintf (fileID,'% s % s % s % s\n', branch')
- system ('rm matched.lines')

Variables

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- close all
- % % % base filder where topo grapg lies bf
- % % hd1

- Harvey
- Rob1
- Peter
- ROb2
- Cartman
- Belinda
- Manipulation
- Robotics
- nodes = 0:length(nodesname)-1
- nodesname
- % % hd2
- edges
- hd3
- edgelist = [ ]
- for i
- d = bb(end)
- e = str2double(bb(end-1))
- s = str2double(bb(end-2))
- sf = fold
- df = bb
- dr = 's'
- end bb
- linect =[ ]
- kl = kimlists
- end L = length(kl)
- for j
- status
- end [M I] = max(linect)
- flagx = -1

16.39.1 Function Documentation

16.39.1.1 addpath()

```
% % % add line matching lib path addpath (
             './linematching'  )
```

16.39.1.2 branch()

```
end branch (
             :  ,
             end  )
```

16.39.1.3 DAMAGES()

```
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CONSEQUENTIAL DAMAGES (
            INCLUDING ,
            BUT NOT LIMITED TO,
            PROCUREMENT OF % *SUBSTITUTE GOODS OR SERVICES;LOSS OF USE,
            DATA ,
            OR PROFITS;OR BUSINESS % * INTERRUPTION )
```

16.39.1.4 elseif() [1/5]

```
elseif (
            (I==L)||(linect(I-1) > linect(I+1))  )
```

16.39.1.5 elseif() [2/5]

```
elseif (
            dr  = ='e' )
```

16.39.1.6 elseif() [3/5]

```
elseif (
            flagx  = =0 )
```

16.39.1.7 elseif() [4/5]

```
elseif (
            linect(I-1)<=linect(I+1)  )  [pure virtual]
```

16.39.1.8 elseif() [5/5]

```
elseif ( ) = ['Edge_',num2str(e),num2str(e-1)]
```

16.39.1.9 fprintf() [1/4]

```
fprintf (
            fileID ,
            '% s % 2s\n' ,
            nodesname'  )
```

16.39.1.10 fprintf() [2/4]

```
fprintf (
            fileID ,
            '% s % s % s % s\n' ,
            branch'  )
```

16.39.1.11 fprintf() [3/4]

```
fprintf (
            fileID ,
            '% s % s % s\n' ,
            edges'  )
```

16.39.1.12 fprintf() [4/4]

```
fprintf (
            fileID ,
            '% s \n' ,
            hd3  )
```

16.39.1.13 if() [1/4]

```
end if (
            dr  = ='s' ) = indd+1
```

16.39.1.14 if() [2/4]

```
end if (
            flagx  = =1 )
```

16.39.1.15 if() [3/4]

```
if (
             I   = =1 )  [pure virtual]
```

16.39.1.16 if() [4/4]

```
if ( )
```

16.39.1.17 matches()

```
end matches (
             i   )
```

16.39.1.18 system()

```
system (
             'rm matched.lines'   )
```

16.39.1.19 TORT()

```
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CONSEQUENTIAL WHETHER IN % STRICT OR TORT (
             INCLUDING NEGLIGENCE OR OTHERWISE )
```

16.39.2 Variable Documentation

16.39.2.1 all

```
close all
```

Definition at line 23 of file generate_configfile.m.

16.39.2.2 bb

```
end bb
```

Initial value:

```
= [sf,' ',df,' ' , dr]

    [imlist kimlists] = getImages([bf sf])
```

Definition at line 129 of file generate_configfile.m.

16.39.2.3 Belinda

```
Belinda
```

Definition at line 43 of file generate_configfile.m.

16.39.2.4 bf

```
% % % base filder where topo grapg lies bf
```

Initial value:

```
= '/home/suman/soft/pepper_navigation/data/tmap/'
fileID = fopen([bf,'conf.txt'],'w')
```

Definition at line 31 of file generate_configfile.m.

16.39.2.5 Cartman

```
Cartman
```

Definition at line 42 of file generate_configfile.m.

16.39.2.6 clc

```
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IMPLIED BUT NOT LIMITED THE %* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PUR↩
POSE %* ARE DISCLAIMED IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE %* LIABLE FOR ANY OR %*
CONSEQUENTIAL WHETHER IN % STRICT OR EVEN IF ADVISED OF THE %* POSSIBILITY OF SUCH DAMAGE %* % clc
```

Definition at line 22 of file generate_configfile.m.

16.39.2.7 CONTRACT

```
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CONSEQUENTIAL WHETHER IN %* CONTRACT
```

Definition at line 10 of file generate_configfile.m.

16.39.2.8 d

```
d = bb(end)
```

Definition at line 102 of file generate_configfile.m.

16.39.2.9 df

```
df = bb
```

Definition at line 109 of file generate_configfile.m.

16.39.2.10 DIRECT

```
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IMPLIED BUT NOT LIMITED THE %* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PUR←
POSE %* ARE DISCLAIMED IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE %* LIABLE FOR ANY DIRE←
CT
```

Definition at line 6 of file generate_configfile.m.

16.39.2.11 dr

```
dr = 's'
```

Definition at line 110 of file generate_configfile.m.

16.39.2.12 e

```
e = str2double(bb(end-1))
```

Definition at line 103 of file generate_configfile.m.

16.39.2.13 edgelist

```
edgelist = [ ]
```

Definition at line 96 of file generate_configfile.m.

16.39.2.14 edges

```
edges
```

Initial value:

```
= [
"Edge_01" "0"  "1"
"Edge_12" "1"  "2"
"Edge_23" "2"  "3"
"Edge_34" "3"  "4"
"Edge_45" "4"  "5"
"Edge_56" "5"  "6"
"Edge_60" "6"  "0"
"Edge_10" "1"  "0"
"Edge_21" "2"  "1"
"Edge_32" "3"  "2"
"Edge_43" "4"  "3"
"Edge_54" "5"  "4"
"Edge_65" "6"  "5"
"Edge_06" "0"  "6"
]
```

Definition at line 56 of file generate_configfile.m.

16.39.2.15 end

```
end[M I] = max(linect)
```

Definition at line 155 of file generate_configfile.m.

16.39.2.16 EXEMPLARY

```
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PLARY
```

Definition at line 6 of file generate_configfile.m.

16.39.2.17 flagx

```
flagx = -1
```

Definition at line 156 of file generate_configfile.m.

16.39.2.18 Harvey

```
Harvey
```

Definition at line 38 of file generate_configfile.m.

16.39.2.19 hd1

```
% % hd1
```

Initial value:
```
="Nodes"
nodesname =
```

Definition at line 35 of file generate_configfile.m.

16.39.2.20 hd2

```
% % hd2
```

Initial value:
```
= "Edges"
fprintf(fileID,'%s\n',hd2)
```

Definition at line 54 of file generate_configfile.m.

16.39.2.21 hd3

```
hd3
```

Initial value:
```
= "Branches"
branch = [
"Branch_17c" "1"  "7"  "18"
"Branch_75c" "7"  "5"  "4"
"Branch_28c" "2"  "8"  "11"
"Branch_84c" "8"  "4"  "3"
"Branch_57c" "5"  "7"  "9"
"Branch_71c" "7"  "1"  "3"
"Branch_48c" "4"  "8"  "17"
"Branch_82c" "8"  "2"  "4"
"Branch_17a" "1"  "7"  "10"
"Branch_75a" "7"  "5"  "3"
"Branch_28a" "2"  "8"  "15"
"Branch_84a" "8"  "4"  "1"
"Branch_57a" "5"  "7"  "21"
"Branch_71a" "7"  "1"  "0"
"Branch_48a" "4"  "8"  "11"
"Branch_82a" "8"  "2"  "4"
 ]
```

Definition at line 73 of file generate_configfile.m.

16.39.2.22 i

```
for i
```

Initial value:

```
=1:length(branch)

    bb=sscanf(branch(i,1),'%c')
```

Definition at line 99 of file generate_configfile.m.

16.39.2.23 INCIDENTAL

```
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IMPLIED BUT NOT LIMITED THE %* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PUR↩
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DENTAL
```

Definition at line 6 of file generate_configfile.m.

16.39.2.24 INCLUDING

```
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IMPLIED INCLUDING
```

Definition at line 3 of file generate_configfile.m.

16.39.2.25 INDIRECT

```
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RECT
```

Definition at line 6 of file generate_configfile.m.

16.39.2.26 j

```
for j
```

Initial value:

```
=1:L
           kim2 = kl{j}
```

Definition at line 148 of file generate_configfile.m.

16.39.2.27 kl

```
kl = kimlists
```

Definition at line 139 of file generate_configfile.m.

16.39.2.28 L

```
end L = length(kl)
```

Definition at line 147 of file generate_configfile.m.

16.39.2.29 LIABILITY

```
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CONSEQUENTIAL WHETHER IN % STRICT LIABILITY
```

Definition at line 10 of file generate_configfile.m.

16.39.2.30 linect

```
linect =[]
```

Definition at line 135 of file generate_configfile.m.

16.39.2.31 Manipulation

```
Manipulation
```

Definition at line 44 of file generate_configfile.m.

16.39.2.32 nodes

```
nodes = 0:length(nodesname)-1
```

Definition at line 48 of file generate_configfile.m.

16.39.2.33 nodesname

```
nodesname
```

Initial value:
```
= [nodesname, nodes']
fprintf(fileID,'%s\n',hd1)
```

Definition at line 49 of file generate_configfile.m.

16.39.2.34 Peter

```
Peter
```

Definition at line 40 of file generate_configfile.m.

16.39.2.35 Rob1

```
Rob1
```

Definition at line 39 of file generate_configfile.m.

16.39.2.36 ROb2

```
ROb2
```

Definition at line 41 of file generate_configfile.m.

16.39.2.37 Robotics

```
Robotics
```

Definition at line 46 of file generate_configfile.m.

16.39.2.38 s

```
s = str2double(bb(end-2))
```

Definition at line 104 of file generate_configfile.m.

16.39.2.39 sf

```
sf = fold
```

Definition at line 108 of file generate_configfile.m.

16.39.2.40 SPECIAL

```
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IAL
```

Definition at line 6 of file generate_configfile.m.

16.39.2.41 status

```
end match lines if status
```

Initial value:

```
= matchLines(kim,kim2,'matched.lines')
           matchindex  = load('matched.lines')
```

Definition at line 150 of file generate_configfile.m.

16.39.2.42 TO

```
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```

Definition at line 3 of file generate_configfile.m.

16.39.2.43 WARRANTIES

```
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```

Definition at line 3 of file generate_configfile.m.

16.40 mapping/getImages.m File Reference

Variables

- % % By suman raj bista % function to get name of imagesfiles from folder function [ListOfImageNames TextFileList]

16.40.1 Variable Documentation

16.40.1.1 function

```
% % By suman raj bista % function to get name of imagesfiles from folder function[ListOfImageNames
TextFileList]
```

Initial value:

```
= getImages(folder)
%
global fodseq
```

Definition at line 4 of file getImages.m.

16.41 mapping/select_ReferenceImages.m File Reference

Functions

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- % % % set path for linematching and trifocal tensor estimation addpath ('./tftLine')
- addpath ('./linematching')
- if (size(gim, 3)==3) gim
- imwrite (gim, 'tmpimg.pgm')
- save ('lines_l.tmp', 'lines', '-ascii', '-tabs')
- system (['cp ', im,' ', KFD])
- % save ([KFD,'/kl_', im(end-7:end-3), 'txt'], 'lines', '-ascii', '-tabs')
- dlmwrite ([KFD,'/kl_', im(end-8:end-3), 'txt'], lines, 'delimiter','\t', 'precision','%.12f')
- disp ('New Key Image Added')
- dlmwrite ('lines_r.tmp', lines, 'delimiter','\t', 'precision','%.12f')
- if length (matchindex)< 10 % status
- if (sfc >2) ct=0
- % save ('lines_t.tmp', 'linesprev', '-ascii', '-tabs')
- dlmwrite ('lines_l.tmp', linesprev, 'delimiter','\t', 'precision','%.12f')
- if (length(validindex)< thres||(cr< 0.5 &&pr< 0.5)) ct=0

Variables

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- clc
- % % % folder that contains all the images in png % path of basefolder % % bf = '../roboroom'
- % % threshold no of miminum match lines thres = 20
- % % % image seq is inside imgs folder [imList] =getImages([bf '/imgs_acquired'])
- % key reference images will be stored in kfls folder KFD = [bf '/ref_imgs']
- % % mp = [ ]
- matchedlines = [ ]
- indxmatch =[ ]
- aaa =[ ]
- lc = [ ]
- ct = 0
- global imSize = [640 480]
- sfc = 0
- % % for j
- % % detect lines status = detectLines('tmpimg.pgm','edlines.out')
- lines = load('edlines.out')
- gim_t = gim
- im_t = im

- linest = lines
- linesmatch =[ ]
- pr = 1
- matchindex = load('matched.lines')
- linesprev = linest(matchindex(:,1),:)
- % if view line m
- % if view line atching fialed Add new ref image continue
- end % inliers = validindex<0.1
- cr = sum(inliers)/length(validindex)

16.41.1 Function Documentation

16.41.1.1 addpath() [1/2]

```
addpath (
             './linematching'  )
```

16.41.1.2 addpath() [2/2]

```
% % % set path for linematching and trifocal tensor estimation addpath (
             './tftLine'  )
```

16.41.1.3 DAMAGES()

```
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IMPLIED BUT NOT LIMITED THE %* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PUR←
POSE %* ARE DISCLAIMED IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE %* LIABLE FOR ANY OR %*
CONSEQUENTIAL DAMAGES (
             INCLUDING ,
             BUT NOT LIMITED TO,
             PROCUREMENT OF % *SUBSTITUTE GOODS OR SERVICES;LOSS OF USE,
             DATA ,
             OR PROFITS;OR BUSINESS % * INTERRUPTION )
```

16.41.1.4 disp()

```
disp (
             'New Key Image Added'  )
```

16.41.1.5 dlmwrite() [1/3]

```
dlmwrite (
            'lines_l.tmp' ,
            linesprev ,
            'delimiter' ,
            '\t' ,
            'precision' ,
            '%.12f'  )
```

16.41.1.6 dlmwrite() [2/3]

```
dlmwrite (
            'lines_r.tmp' ,
            lines ,
            'delimiter' ,
            '\t' ,
            'precision' ,
            '%.12f'  )
```

16.41.1.7 dlmwrite() [3/3]

```
dlmwrite (
            lines ,
            'delimiter' ,
            '\t' ,
            'precision' ,
            '%.12f'  )
```

16.41.1.8 if() [1/3]

```
if ( )  [pure virtual]
```

16.41.1.9 if() [2/3]

```
if (
            sfc ,
            2  )  [pure virtual]
```

16.41.1.10 if() [3/3]

```
if (
            size(gim, 3)  = =3 )
```

16.41.1.11 imwrite()

```
imwrite (
             gim ,
             'tmpimg.pgm'  )
```

16.41.1.12 length()

```
if length (
             matchindex  )
```

16.41.1.13 save() [1/3]

```
save (
             'lines_l.tmp' ,
             'lines' ,
             '-ascii' ,
             '-tabs'  )
```

16.41.1.14 save() [2/3]

```
% save (
             'lines_t.tmp' ,
             'linesprev' ,
             '-ascii' ,
             '-tabs'  )
```

16.41.1.15 save() [3/3]

```
else save (
             'lines' ,
             '-ascii' ,
             '-tabs'  )
```

16.41.1.16 system()

```
system ( )
```

16.41.1.17 TORT()

```
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CONSEQUENTIAL WHETHER IN % STRICT OR TORT (
             INCLUDING NEGLIGENCE OR OTHERWISE )
```

16.41.2 Variable Documentation

16.41.2.1 aaa

```
aaa =[]
```

Definition at line 52 of file select_ReferenceImages.m.

16.41.2.2 all

```
close all
```

Definition at line 24 of file select_ReferenceImages.m.

16.41.2.3 bf

```
% % % folder that contains all the images in png % path of basefolder % % bf = '../roboroom'
```

Definition at line 36 of file select_ReferenceImages.m.

16.41.2.4 clc

```
clc
```

Definition at line 26 of file select_ReferenceImages.m.

16.41.2.5 continue

```
% if view line atching fialed Add new ref image continue
```

Definition at line 130 of file select_ReferenceImages.m.

16.41.2.6 CONTRACT

```
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CONSEQUENTIAL WHETHER IN %* CONTRACT
```

Definition at line 10 of file select_ReferenceImages.m.

16.41.2.7 cr

```
cr = sum(inliers)/length(validindex)
```

Definition at line 135 of file select_ReferenceImages.m.

16.41.2.8 ct

```
catch ct = 0
```

Definition at line 54 of file select_ReferenceImages.m.

16.41.2.9 DIRECT

```
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IMPLIED BUT NOT LIMITED THE %* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PUR←
POSE %* ARE DISCLAIMED IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE %* LIABLE FOR ANY DIRE←
CT
```

Definition at line 6 of file select_ReferenceImages.m.

16.41.2.10 EXEMPLARY

```
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IMPLIED BUT NOT LIMITED THE %* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PUR←
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PLARY
```

Definition at line 6 of file select_ReferenceImages.m.

16.41.2.11 folder

```
% % % image seq is inside imgs folder[imList] =getImages([bf '/imgs_acquired'])
```

Definition at line 42 of file select_ReferenceImages.m.

16.41.2.12 gim_t

```
gim_t = gim
```

Definition at line 80 of file select_ReferenceImages.m.

16.41.2.13 im_t

```
im_t = im
```

Definition at line 81 of file select_ReferenceImages.m.

16.41.2.14 imSize

```
end imSize = [640 480]
```

Definition at line 55 of file select_ReferenceImages.m.

16.41.2.15 INCIDENTAL

```
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DENTAL
```

Definition at line 6 of file select_ReferenceImages.m.

16.41.2.16 INCLUDING

```
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IMPLIED INCLUDING
```

Definition at line 3 of file select_ReferenceImages.m.

16.41.2.17 INDIRECT

```
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POSE %* ARE DISCLAIMED IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE %* LIABLE FOR ANY INDI↩
RECT
```

Definition at line 6 of file select_ReferenceImages.m.

16.41.2.18 indxmatch

```
indxmatch =[ ]
```

Definition at line 51 of file select_ReferenceImages.m.

16.41.2.19 inliers

```
end % inliers = validindex<0.1
```

Definition at line 133 of file select_ReferenceImages.m.

16.41.2.20 j

```
% % for j
```

Initial value:
```
=1:length(imList)
    %% read images
       im = imList{j}
       gim = imread(imList{j})
```

Definition at line 61 of file select_ReferenceImages.m.

16.41.2.21 KFD

```
% key reference images will be stored in kfls folder KFD = [bf '/ref_imgs']
```

Definition at line 45 of file select_ReferenceImages.m.

16.41.2.22 lc

```
lc = [ ]
```

Definition at line 53 of file select_ReferenceImages.m.

16.41.2.23 LIABILITY

```
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IMPLIED BUT NOT LIMITED THE %* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PUR←
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CONSEQUENTIAL WHETHER IN % STRICT LIABILITY
```

Definition at line 10 of file select_ReferenceImages.m.

16.41.2.24 lines

```
lines = load('edlines.out')
```

Definition at line 73 of file select_ReferenceImages.m.

16.41.2.25 linesmatch

```
linesmatch =[ ]
```

Definition at line 87 of file select_ReferenceImages.m.

16.41.2.26 linesprev

```
linesprev = linest(matchindex(:,1),:)
```

Definition at line 118 of file select_ReferenceImages.m.

16.41.2.27 linest

```
linest = lines
```

Definition at line 82 of file select_ReferenceImages.m.

16.41.2.28 m

```
% if view line m
```

Definition at line 129 of file select_ReferenceImages.m.

16.41.2.29 matchedlines

```
if ct try matchedlines = [ ]
```

Definition at line 50 of file select_ReferenceImages.m.

16.41.2.30 matchindex

```
matchindex = load('matched.lines')
```

Definition at line 98 of file select_ReferenceImages.m.

16.41.2.31 mp

```
% % mp = [ ]
```

Definition at line 49 of file select_ReferenceImages.m.

16.41.2.32 pr

```
pr = 1
```

Definition at line 90 of file select_ReferenceImages.m.

16.41.2.33 sfc

```
end else sfc = 0
```

Definition at line 57 of file select_ReferenceImages.m.

16.41.2.34 SPECIAL

```
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IAL
```

Definition at line 6 of file select_ReferenceImages.m.

16.41.2.35 status

```
end % % match lines if status = detectLines('tmpimg.pgm','edlines.out')
```

Definition at line 72 of file select_ReferenceImages.m.

16.41.2.36 thres

```
% % threshold no of miminum match lines thres = 20
```

Definition at line 39 of file select_ReferenceImages.m.

16.41.2.37 TO

```
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```

Definition at line 3 of file select_ReferenceImages.m.

16.41.2.38 WARRANTIES

```
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```
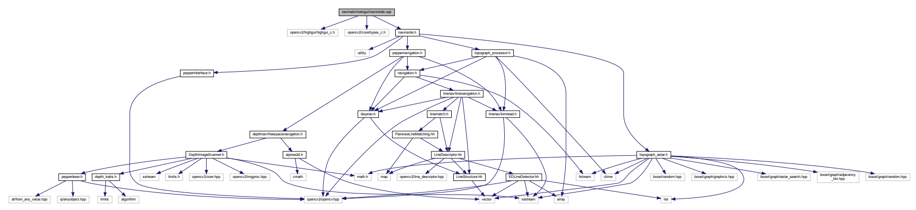

Definition at line 3 of file select_ReferenceImages.m.

16.42 navmain/maingui/navinside.cpp File Reference

```
#include "opencv2/highgui/highgui_c.h"
#include <opencv2/core/types_c.h>
#include "navinside.h"
```

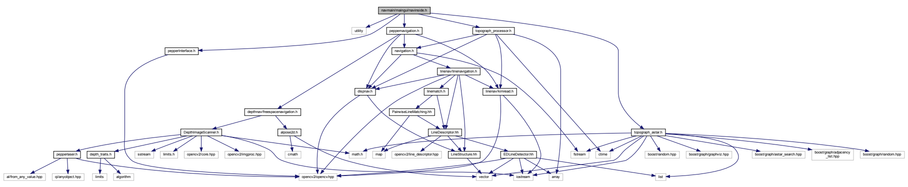
Include dependency graph for navinside.cpp:



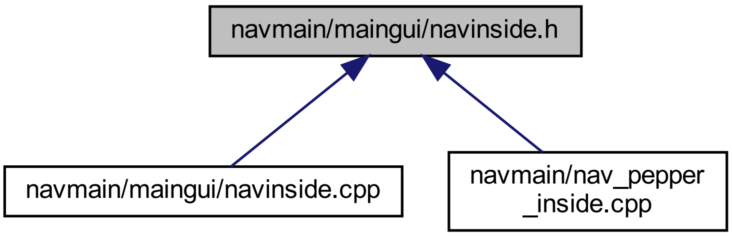
16.43 navmain/maingui/navinside.h File Reference

```
#include <utility>
#include "pepperInterface.h"
#include "peppernavigation.h"
#include "topograph_astar.h"
#include "topograph_processor.h"
```

Include dependency graph for navinside.h:



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


navmain/maingui/navinside.h
navmain/maingui/navinside.cpp
navmain/nav_pepper _inside.cpp

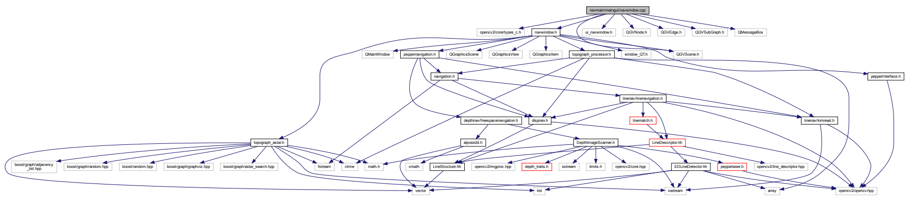
Classes

- class NavInside

16.44 navmain/maingui/navwindow.cpp File Reference

```
#include <opencv2/core/types_c.h>
#include "navwindow.h"
#include "ui_navwindow.h"
#include "QGVScene.h"
#include "QGVNode.h"
#include "QGVEdge.h"
#include "QGVSubGraph.h"
#include <QMessageBox>
```

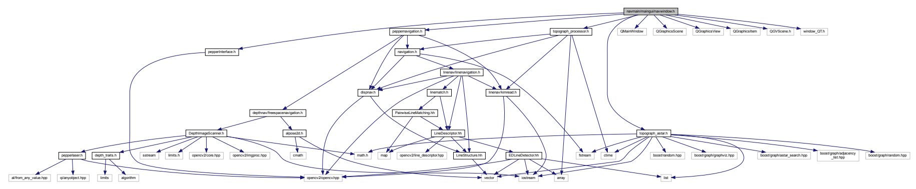
Include dependency graph for navwindow.cpp:



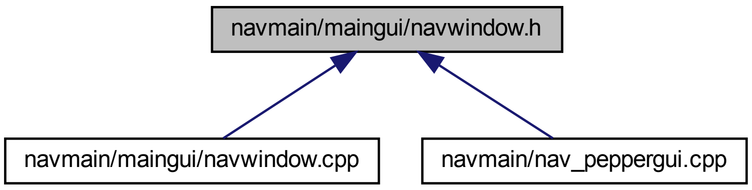
16.45 navmain/maingui/navwindow.h File Reference

```
#include "pepperInterface.h"
#include "peppernavigation.h"
#include <QMainWindow>
#include "topograph_astar.h"
#include <QGraphicsScene>
#include <QGraphicsView>
#include <QGraphicsItem>
#include "QGVScene.h"
#include "topograph_processor.h"
#include "window_QT.h"
```

Include dependency graph for navwindow.h:



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


navmain/maingui/navwindow.h
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- class NavWindow

Namespaces

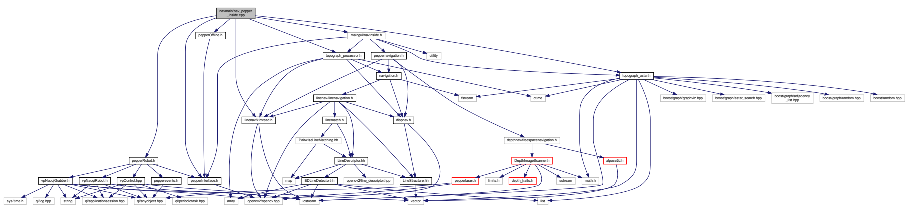
- Ui

16.46 navmain/nav_pepper_inside.cpp File Reference

```
#include "pepperInterface.h"
#include "pepperRobot.h"
#include "pepperOffline.h"
#include "topograph_astar.h"
#include "linenav/kimread.h"
#include "topograph_processor.h"
```

```
#include "maingui/navinside.h"
```

Include dependency graph for nav_pepper_inside.cpp:



Functions

- void usage (int argc, char ∗∗argv)
- int main (int argc, char ∗∗argv)

16.46.1 Function Documentation

16.46.1.1 main()

```
int main (
            int argc,
            char ** argv )
```

Define Nodes

Define Edges

Definition at line 38 of file nav_pepper_inside.cpp.

16.46.1.2 usage()

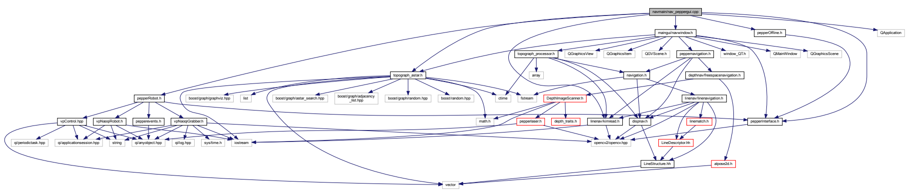
```
void usage (
            int argc,
            char ** argv )
```

Definition at line 33 of file nav_pepper_inside.cpp.

16.47 navmain/nav_peppergui.cpp File Reference

```
#include "pepperInterface.h"
#include "pepperRobot.h"
#include "pepperOffline.h"
#include "topograph_astar.h"
#include "linenav/kimread.h"
#include "maingui/navwindow.h"
#include <QApplication>
```

Include dependency graph for nav_peppergui.cpp:



Functions

- void usage (int argc, char ∗∗argv)
- int main (int argc, char ∗∗argv)

16.47.1 Function Documentation

16.47.1.1 main()

```
int main (
            int argc,
            char ** argv )
```

Define Nodes

Define Edges

Definition at line 37 of file nav_peppergui.cpp.

16.47.1.2 usage()

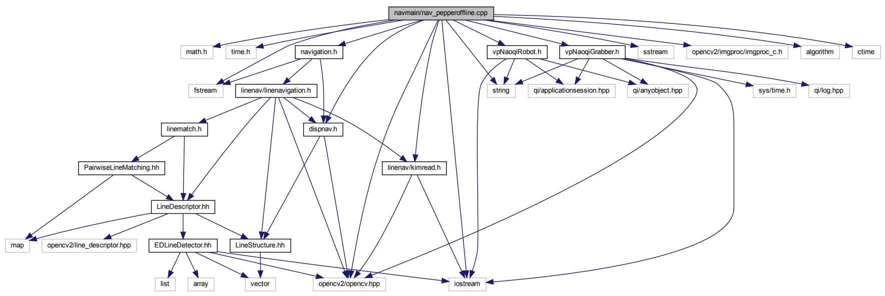
```
void usage (
            int argc,
            char ** argv )
```

Definition at line 32 of file nav_peppergui.cpp.

16.48 navmain/nav_pepperoffline.cpp File Reference

```
#include <math.h>
#include <time.h>
#include <fstream>
#include <opencv2/opencv.hpp>
#include <string>
#include <sstream>
#include <opencv2/imgproc/imgproc_c.h>
#include <iostream>
#include <algorithm>
#include <ctime>
#include "linenav/kimread.h"
#include "navigation.h"
#include "linenav/dispnav.h"
#include "vpNaoqiRobot.h"
#include "vpNaoqiGrabber.h"
```

Include dependency graph for nav_pepperoffline.cpp:



Functions

- void usage (int argc, char ∗∗argv)
- int main (int argc, char ∗∗argv)

16.48.1 Function Documentation

16.48.1.1 main()

```
int main (
            int argc,
            char ** argv )
```

Definition at line 35 of file nav_pepperoffline.cpp.

16.48.1.2 usage()

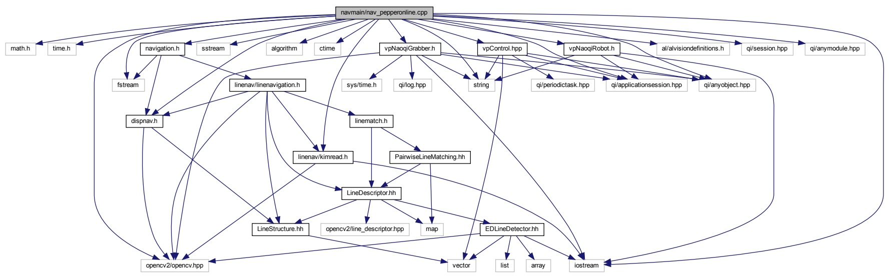
```
void usage (
            int argc,
            char ** argv )
```

Definition at line 28 of file nav_pepperoffline.cpp.

16.49 navmain/nav_pepperonline.cpp File Reference

```
#include <math.h>
#include <time.h>
#include <fstream>
#include <opencv2/opencv.hpp>
#include <string>
#include <sstream>
#include <iostream>
#include <algorithm>
#include <ctime>
#include "linenav/kimread.h"
#include "navigation.h"
#include "linenav/dispnav.h"
#include <vpNaoqiGrabber.h>
#include <vpNaoqiRobot.h>
#include <al/alvisiondefinitions.h>
#include <qi/session.hpp>
#include <qi/applicationsession.hpp>
#include <qi/anymodule.hpp>
#include <qi/anyobject.hpp>
#include "vpControl.hpp"
```

Include dependency graph for nav_pepperonline.cpp:



Functions

- void usage (int argc, char ∗∗argv)
- const std::string currentDateTime ()
- int main (int argc, char ∗∗argv)

16.49.1 Function Documentation

16.49.1.1 currentDateTime()

```
const std::string currentDateTime ( )
```

Definition at line 39 of file nav_pepperonline.cpp.

16.49.1.2 main()

```
int main (
            int argc,
            char ** argv )
```

Definition at line 53 of file nav_pepperonline.cpp.

16.49.1.3 usage()

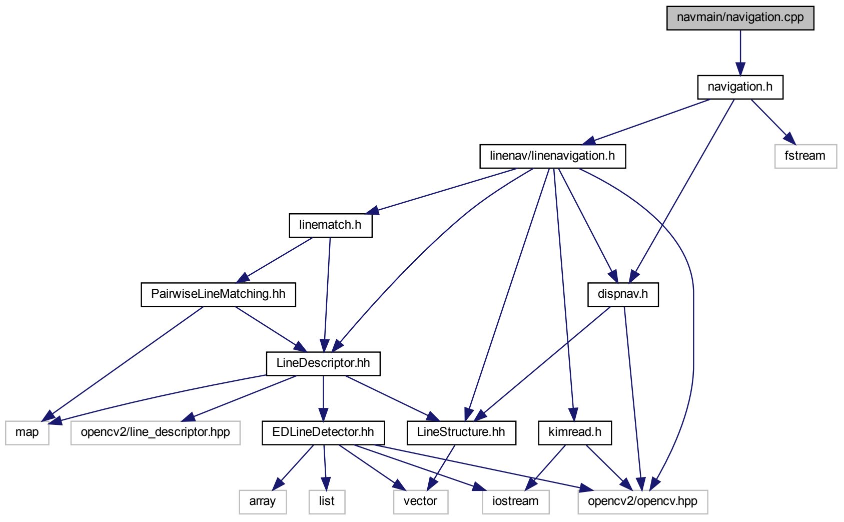
```
void usage (
            int argc,
            char ** argv )
```

Definition at line 35 of file nav_pepperonline.cpp.

16.50 navmain/navigation.cpp File Reference

```
#include "navigation.h"
```

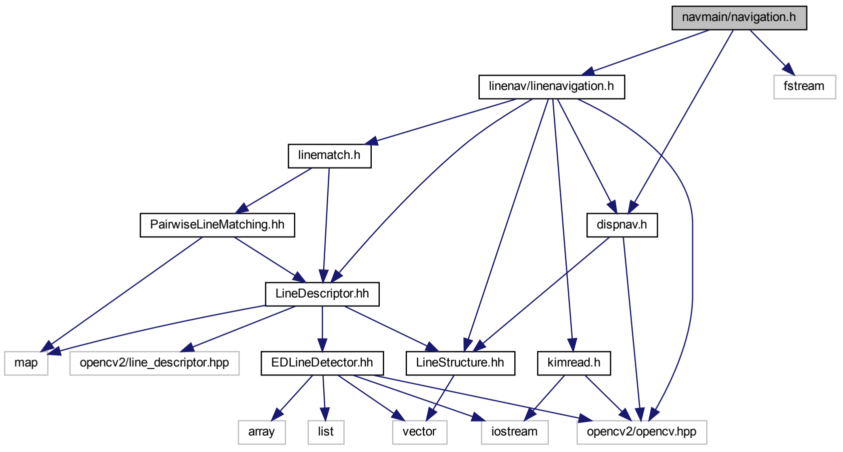
Include dependency graph for navigation.cpp:



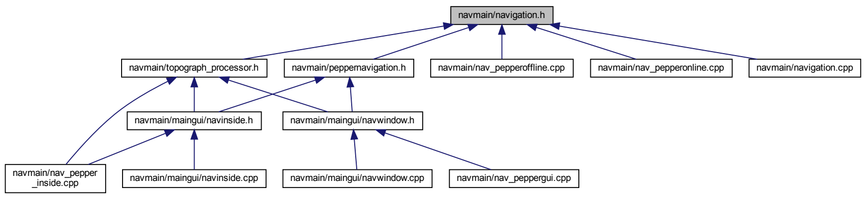
16.51 navmain/navigation.h File Reference

```
#include "linenav/linenavigation.h"
#include "linenav/dispnav.h"
```

`#include <fstream>`
Include dependency graph for navigation.h:



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


navmain/navigation.h
navmain/topograph_processor.h
navmain/peppernavigation.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/navigation.cpp
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/nav_pepper _inside.cpp
navmain/maingui/navinside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

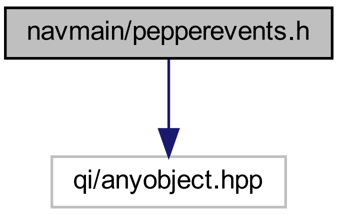
Classes

- class navigation

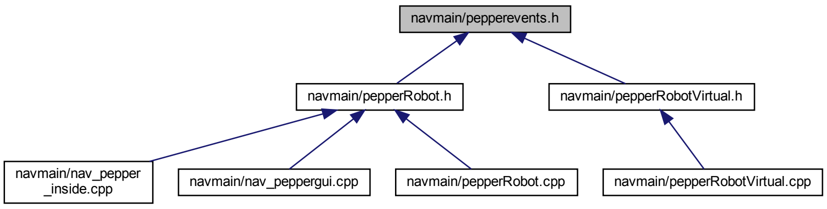
  The navigation class.

16.52 navmain/pepperevents.h File Reference

`#include <qi/anyobject.hpp>`
Include dependency graph for pepperevents.h:



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


navmain/pepperevents.h
navmain/pepperRobot.h
navmain/pepperRobotVirtual.h
navmain/nav_pepper_inside.cpp
navmain/nav_peppergui.cpp
navmain/pepperRobot.cpp
navmain/pepperRobotVirtual.cpp

Classes

- class pepperServices

    The pepperServices class.

Functions

- QI_REGISTER_OBJECT (pepperServices, moveCallback, armsCallback)

16.52.1 Function Documentation

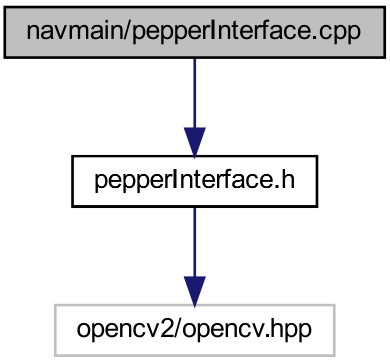
16.52.1.1 QI_REGISTER_OBJECT()

```
QI_REGISTER_OBJECT (
            pepperServices ,
            moveCallback ,
            armsCallback )
```

Register Callback Services

16.53 navmain/pepperInterface.cpp File Reference

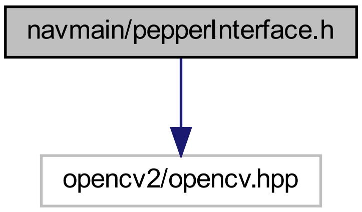
```
#include "pepperInterface.h"
```
Include dependency graph for pepperInterface.cpp:



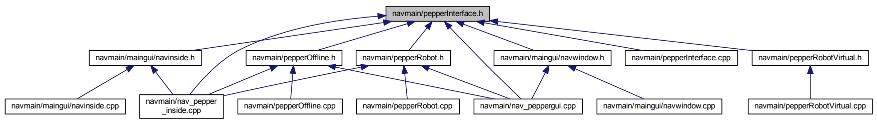
16.54 navmain/pepperInterface.h File Reference

```
#include <opencv2/opencv.hpp>
```

Include dependency graph for pepperInterface.h:



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


navmain/pepperInterface.h
navmain/maingui/navinside.h
navmain/pepperOffline.h
navmain/pepperRobot.h
navmain/maingui/navwindow.h
navmain/pepperInterface.cpp
navmain/pepperRobotVirtual.h
navmain/maingui/navinside.cpp
navmain/nav_pepper _inside.cpp
navmain/pepperOffline.cpp
navmain/pepperRobot.cpp
navmain/nav_peppergui.cpp
navmain/maingui/navwindow.cpp
navmain/pepperRobotVirtual.cpp

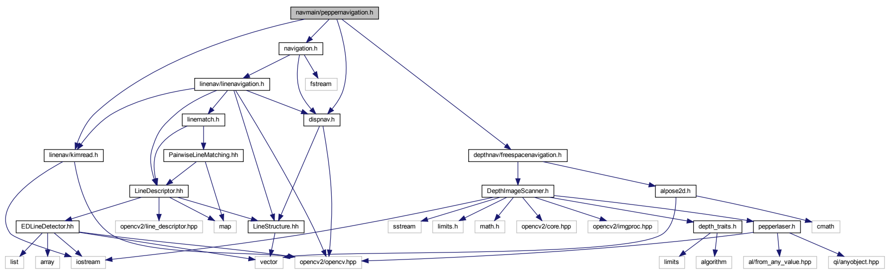
Classes

- class pepperInterface

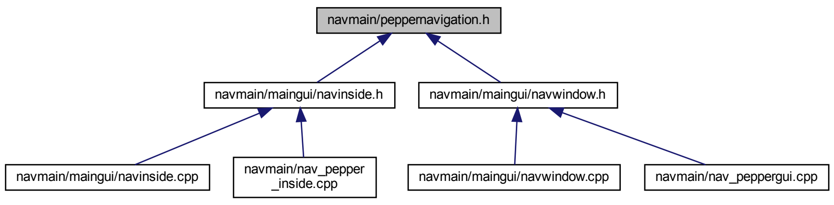
16.55 navmain/peppernavigation.h File Reference

```
#include "linenav/kimread.h"
#include "navigation.h"
#include "linenav/dispnav.h"
#include "depthnav/freespacenavigation.h"
```

Include dependency graph for peppernavigation.h:



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


navmain/peppernavigation.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper_inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

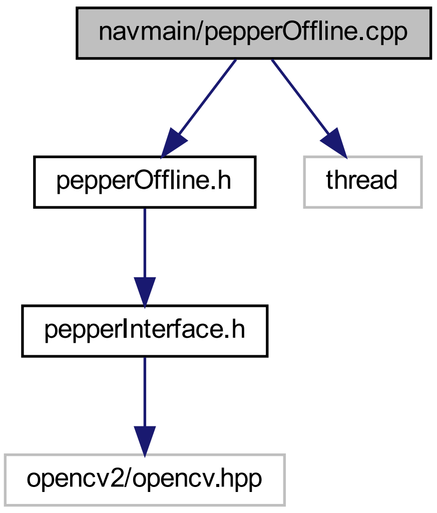
- class pepperNavigation

    The pepperNavigation class.

16.56 navmain/pepperOffline.cpp File Reference

```
#include "pepperOffline.h"
#include <thread>
```

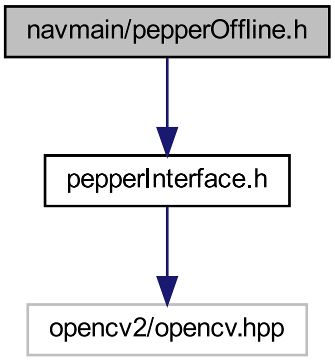
Include dependency graph for pepperOffline.cpp:



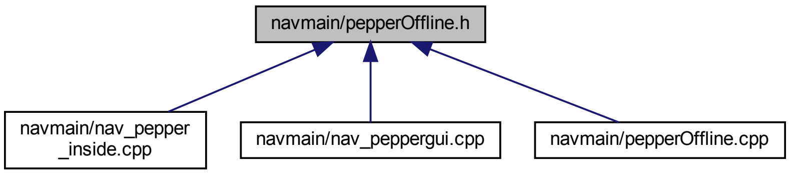
16.57 navmain/pepperOffline.h File Reference

```
#include "pepperInterface.h"
```

Include dependency graph for pepperOffline.h:



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


navmain/pepperOffline.h
navmain/nav_pepper _inside.cpp
navmain/nav_peppergui.cpp
navmain/pepperOffline.cpp

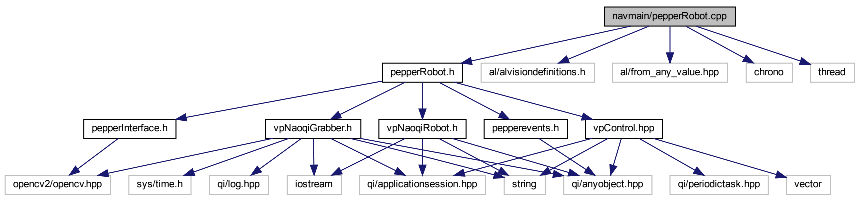
Classes

- class pepperOffline

16.58 navmain/pepperRobot.cpp File Reference

```
#include "pepperRobot.h"
#include <al/alvisiondefinitions.h>
#include <al/from_any_value.hpp>
#include <chrono>
#include <thread>
```

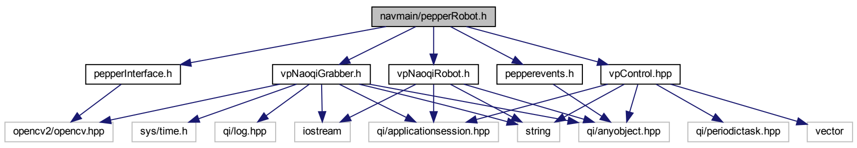
Include dependency graph for pepperRobot.cpp:



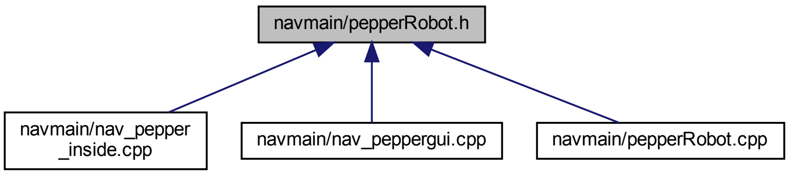
16.59 navmain/pepperRobot.h File Reference

```
#include "pepperInterface.h"
#include "vpNaoqiRobot.h"
#include "vpNaoqiGrabber.h"
#include "vpControl.hpp"
#include "pepperevents.h"
```

Include dependency graph for pepperRobot.h:



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



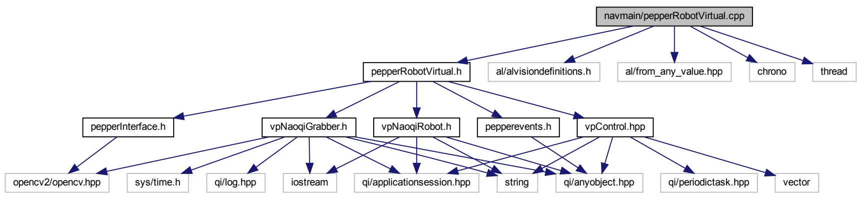
Classes

- class pepperRobot

16.60 navmain/pepperRobotVirtual.cpp File Reference

```
#include "pepperRobotVirtual.h"
#include <al/alvisiondefinitions.h>
#include <al/from_any_value.hpp>
#include <chrono>
#include <thread>
```

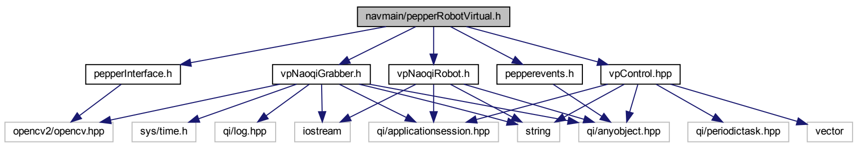
Include dependency graph for pepperRobotVirtual.cpp:



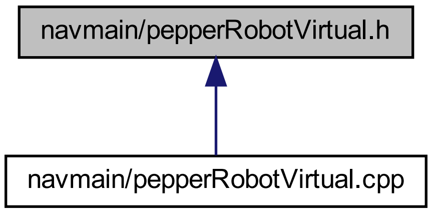
16.61 navmain/pepperRobotVirtual.h File Reference

```
#include "pepperInterface.h"
#include "vpNaoqiRobot.h"
#include "vpNaoqiGrabber.h"
#include "vpControl.hpp"
#include "pepperevents.h"
```

Include dependency graph for pepperRobotVirtual.h:



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



Classes

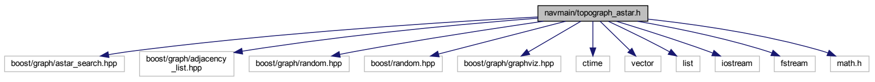
- class pepperRobotVirtual

16.62 navmain/topograph_astar.h File Reference

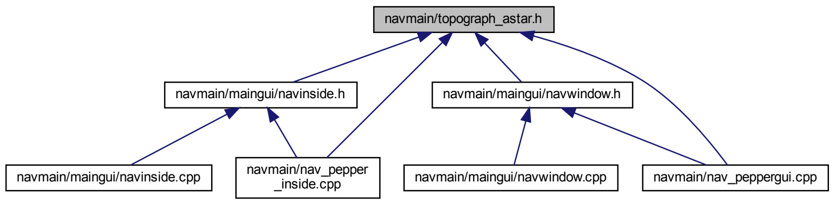
```
#include <boost/graph/astar_search.hpp>
#include <boost/graph/adjacency_list.hpp>
#include <boost/graph/random.hpp>
#include <boost/random.hpp>
#include <boost/graph/graphviz.hpp>
#include <ctime>
#include <vector>
#include <list>
#include <iostream>
#include <fstream>
```

```
#include <math.h>
```

Include dependency graph for topograph_astar.h:



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


navmain/topograph_astar.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper_inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- struct astar::location
- class astar::graph_writer< Name, LocMap >
- class astar::weight_writer< WeightMap >
- class astar::distance_heuristic< Graph, CostType, LocMap >
- class astar::heuristic< Graph, CostType, LocMap >
- struct astar::found_goal
- class astar::astar_goal_visitor< Vertex >
- class astar::astar

    The astar class.

Namespaces

- astar

Typedefs

- typedef float astar::cost
- typedef boost::adjacency_list< boost::listS, boost::vecS, boost::undirectedS, boost::no_property, boost::property< boost::edge_weight_t, cost > > astar::mygraph_t
- typedef boost::property_map< mygraph_t, boost::edge_weight_t >::type astar::WeightMap
- typedef mygraph_t::vertex_descriptor astar::vertex
- typedef mygraph_t::edge_descriptor astar::edge_descriptor
- typedef std::pair< int, int > astar::edge

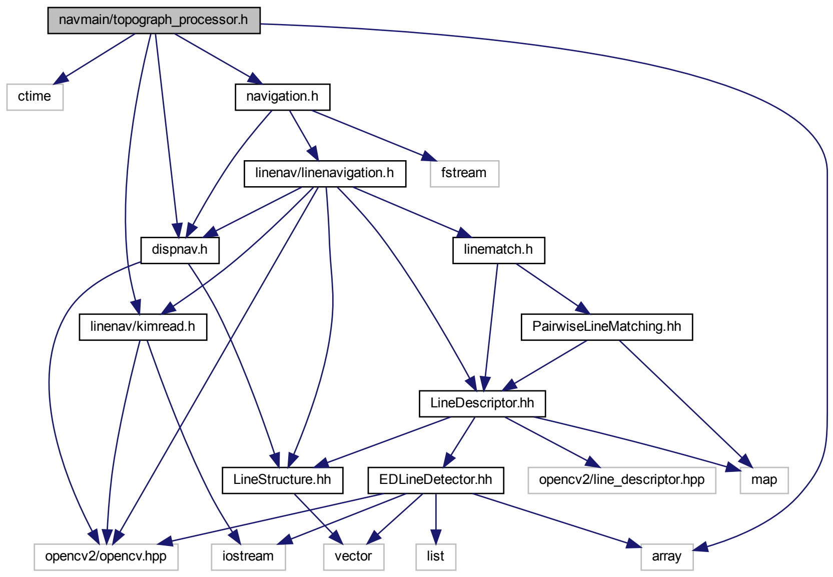
Variables

- const typedef char ∗ astar::node

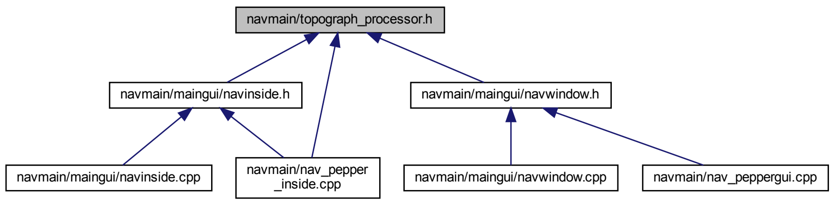
16.63 navmain/topograph_processor.h File Reference

```
#include <ctime>
#include "linenav/kimread.h"
#include "navigation.h"
#include "linenav/dispnav.h"
#include <array>
```

Include dependency graph for topograph_processor.h:



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


navmain/topograph_processor.h
navmain/maingui/navinside.h
navmain/maingui/navwindow.h
navmain/maingui/navinside.cpp
navmain/nav_pepper_inside.cpp
navmain/maingui/navwindow.cpp
navmain/nav_peppergui.cpp

Classes

- struct tgraph::node

  The node struct each node has nodeid starting from 0. nodename : higher level id for node.
- struct tgraph::edge
- struct tgraph::branch
- struct tgraph::topograph

  The topograph struct.
- class tgraph::topmapprocessor

  The topmapprocessor class.

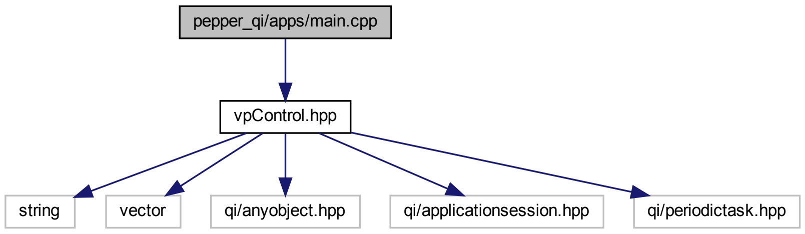
Namespaces

- tgraph

16.64 pepper_qi/apps/main.cpp File Reference

```
#include "vpControl.hpp"
```

Include dependency graph for main.cpp:



Functions

- int main (int argc, char $**$argv)

16.64.1 Function Documentation

16.64.1.1 main()

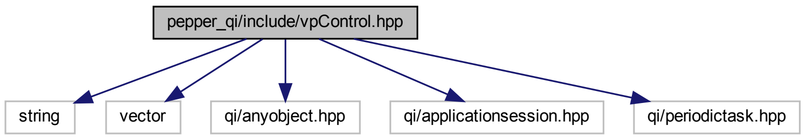
```
int main (
            int argc,
            char ** argv )
```

Definition at line 36 of file main.cpp.

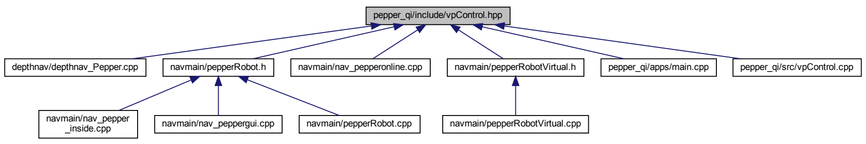
16.65 pepper_qi/include/vpControl.hpp File Reference

```
#include <string>
#include <vector>
#include <qi/anyobject.hpp>
#include <qi/applicationsession.hpp>
```

```
#include <qi/periodictask.hpp>
```
Include dependency graph for vpControl.hpp:



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


pepper_qi/include/vpControl.hpp
depthnav/depthnav_Pepper.cpp
navmain/pepperRobot.h
navmain/nav_pepperonline.cpp
navmain/pepperRobotVirtual.h
pepper_qi/apps/main.cpp
pepper_qi/src/vpControl.cpp
navmain/nav_pepper_inside.cpp
navmain/nav_peppergui.cpp
navmain/pepperRobot.cpp
navmain/pepperRobotVirtual.cpp

Classes

- class vpControl

Functions

- QI_REGISTER_OBJECT (vpControl, getJointValues, printTime, setDesJointVelocity, setOneDesJointVelocity, start, stop, stopJoint)

16.65.1 Function Documentation

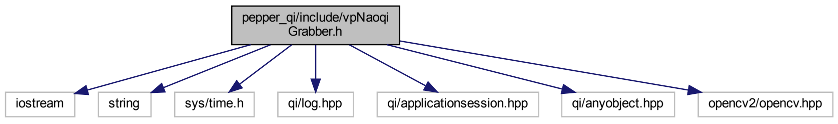
16.65.1.1 QI_REGISTER_OBJECT()

```
QI_REGISTER_OBJECT (
            vpControl ,
            getJointValues ,
            printTime ,
            setDesJointVelocity ,
            setOneDesJointVelocity ,
            start ,
            stop ,
            stopJoint  )
```

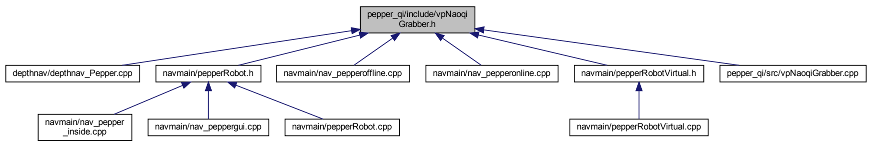
16.66 pepper_qi/include/vpNaoqiGrabber.h File Reference

```
#include <iostream>
#include <string>
#include <sys/time.h>
#include <qi/log.hpp>
#include <qi/applicationsession.hpp>
#include <qi/anyobject.hpp>
#include <opencv2/opencv.hpp>
```

Include dependency graph for vpNaoqiGrabber.h:



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


pepper_qi/include/vpNaoqi Grabber.h
depthnav/depthnav_Pepper.cpp
navmain/pepperRobot.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/pepperRobotVirtual.h
pepper_qi/src/vpNaoqiGrabber.cpp
navmain/nav_pepper _inside.cpp
navmain/nav_peppergui.cpp
navmain/pepperRobot.cpp
navmain/pepperRobotVirtual.cpp

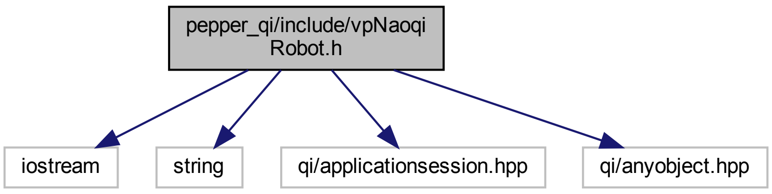
Classes

- class vpNaoqiGrabber

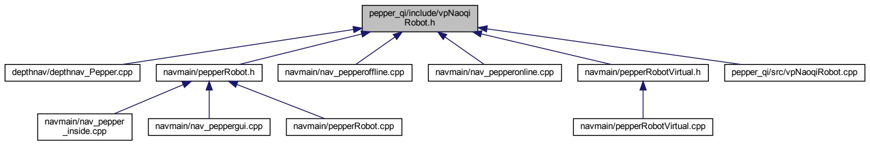
16.67 pepper_qi/include/vpNaoqiRobot.h File Reference

```
#include <iostream>
#include <string>
#include <qi/applicationsession.hpp>
#include <qi/anyobject.hpp>
```

Include dependency graph for vpNaoqiRobot.h:



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


pepper_qi/include/vpNaoqi Robot.h
depthnav/depthnav_Pepper.cpp
navmain/pepperRobot.h
navmain/nav_pepperoffline.cpp
navmain/nav_pepperonline.cpp
navmain/pepperRobotVirtual.h
pepper_qi/src/vpNaoqiRobot.cpp
navmain/nav_pepper _inside.cpp
navmain/nav_peppergui.cpp
navmain/pepperRobot.cpp
navmain/pepperRobotVirtual.cpp

Classes

- class vpNaoqiRobot

Macros

- #define BOOST_SIGNALS_NO_DEPRECATION_WARNING

16.67.1 Macro Definition Documentation

16.67.1.1 BOOST_SIGNALS_NO_DEPRECATION_WARNING

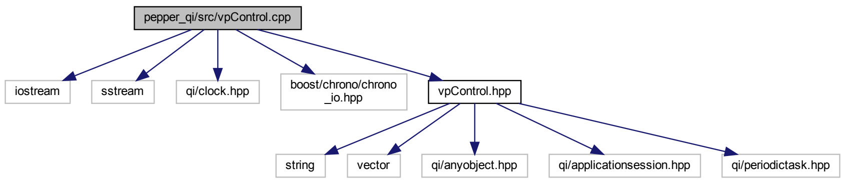
```
#define BOOST_SIGNALS_NO_DEPRECATION_WARNING
```

Definition at line 57 of file vpNaoqiRobot.h.

16.68 pepper_qi/src/vpControl.cpp File Reference

```
#include <iostream>
#include <sstream>
#include <qi/clock.hpp>
#include <boost/chrono/chrono_io.hpp>
#include "vpControl.hpp"
```

Include dependency graph for vpControl.cpp:



Macros

- #define FLAGACC 1
- #define FLAGCTE 2
- #define FLAGDEC 3
- #define FLAGSTO 4
- #define DELTAQMIN 0.0001
- #define OFFSET_BUTEE 0

16.68.1 Macro Definition Documentation

16.68.1.1 DELTAQMIN

```
#define DELTAQMIN 0.0001
```

Definition at line 50 of file vpControl.cpp.

16.68.1.2 FLAGACC

```
#define FLAGACC 1
```

Definition at line 45 of file vpControl.cpp.

16.68.1.3 FLAGCTE

```
#define FLAGCTE 2
```

Definition at line 46 of file vpControl.cpp.

16.68.1.4 FLAGDEC

```
#define FLAGDEC 3
```

Definition at line 47 of file vpControl.cpp.

16.68.1.5 FLAGSTO

```
#define FLAGSTO 4
```

Definition at line 48 of file vpControl.cpp.

16.68.1.6 OFFSET_BUTEE

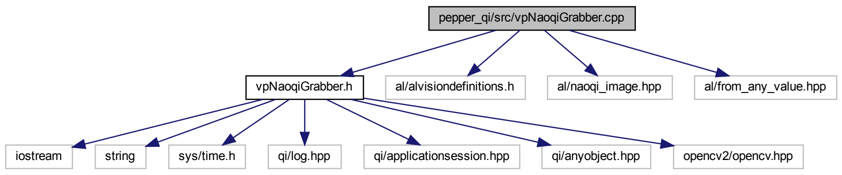
```
#define OFFSET_BUTEE 0
```

Definition at line 51 of file vpControl.cpp.

16.69 pepper_qi/src/vpNaoqiGrabber.cpp File Reference

```
#include "vpNaoqiGrabber.h"
#include "al/alvisiondefinitions.h"
#include "al/naoqi_image.hpp"
#include "al/from_any_value.hpp"
```

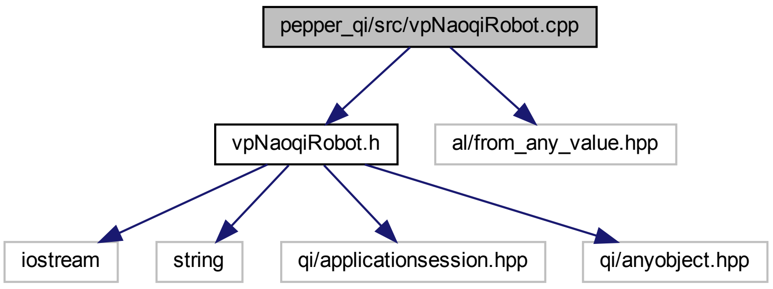
Include dependency graph for vpNaoqiGrabber.cpp:



16.70 pepper_qi/src/vpNaoqiRobot.cpp File Reference

```
#include "vpNaoqiRobot.h"
#include "al/from_any_value.hpp"
```

Include dependency graph for vpNaoqiRobot.cpp:


pepper_qi/src/vpNaoqiRobot.cpp
vpNaoqiRobot.h
al/from_any_value.hpp
iostream
string
qi/applicationsession.hpp
qi/anyobject.hpp