multilaser_surveillance

This package provides tools to perform surveillance on a known area. The area is watched by a number of fixed 2D laser range finders.

Multimodal tracking is based on the perception stack of the STRANDS project. This stack makes use of `BayesTracking`, a library of Bayesian tracking. For more info, read *Real-time multisensor people tracking for human-robot spatial interaction* by Dondrup and Bellotto.

Licence

BSD

Authors

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- `strands_perception_people`: STRANDS project
- `BayesTracking` library: Nicola Bellotto (nbellotto@lincoln.ac.uk)

Compile and install

ROS Fuerte + rosmake

Dependencies with ROS Fuerte:

```
$ sudo apt-get install  ros-fuerte-perception
```

Compile with rosmake:

```
$ cd cmake ; bash package2rosmake.bash
$ rosmake multilaser_surveillance
```

ROS Indigo + catkin

Compile with catkin_make:

```
$ roscd ; cd src
$ git clone https://github.com/strands-project/strands_perception_people.git
$ git clone https://github.com/LCAS/bayestracking.git
$ git clone https://github.com/wg-perception/people.git
$ rospack profile
$ catkin_make --only-pkg-with-deps multilaser_surveillance
```

Run

1) Build the map. The map is automatically saved in `multilaser_surveillance/data/maps`.

```
$ roslaunch multilaser_surveillance stage_arenes.launch  mode:=build
```

2) Perform surveillance. The map is loaded from the same folder.

```
$ roslaunch multilaser_surveillance stage_arenes.launch
```

Publications

Map builder:

- `/map [nav_msgs/OccupancyGrid]` The map, shaped as an occupancy grid.
- `/marker [visualization_msgs/Marker]` A marker showing the outliers and the clusters as colors.
- `/scan [sensor_msgs/PointCloud]` The merged scan of all lasers, rate: max 1 Hz.

Clusterer:

- `/cluster_centers [geometry_msgs/PoseArray]` In the outliers, the centers of the clusters.
- `/outliers [sensor_msgs/PointCloud]` The points not corresponding to the map.

Tracker:

- `/people_tracker/pose_array [geometry_msgs/PoseArray]` The pose of each object, obtained by Bayesian filtering.

Troubleshooting

Problem: The Bayesian tracker does not create tracks if my detector framerate is below 5 Hz (200 ms).

Explanation: By default, the BayesTracking multitracker creates tracks if it receives detections at least every 200 ms, cf. constructor:

```
MultiTracker(unsigned int sequenceSize = 5, double sequenceTime = 0.2)
```

And the embedded `MultiTracker` embedded in people*tracker/simple*tracking.h uses the default constructor:

```
MultiTracker<FilterType, 4> mtrk; // state [x, v_x, y, v_y]
```

Solution: change `sequenceTime` in MultiTracker instantiation.

Open people*tracker/simple*tracking.h

and change the line

```
SimpleTracking() {
```

for:

```
SimpleTracking() : mtrk(5, .5) {
```