A VTK Interface for the Hokuyo UTM 30LX Laser Range Finder

Release 0.00

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October 5, 2010

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Abstract

It is convenient to acquire data in a format which VTK can read directly. To enable this, we provide a wrapper of the Hokuyo UTM-30LX interface in a class vtkHokuyo. The code is currently hosted at git@github.com:daviddoria/vtkHokuyo.git. This class only works on Linux systems.

Latest version available at the Insight Journal [http://hdl.handle.net/10380/3221]

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1 Introduction

One must install the software provided by Hokuyo before using this class.

At the time of this writing, the software is available here: $http://www.hokuyo-aut.jp/02sensor/07scanner/download/urg_programs_en/urg-0.8.11.zip$

We have also included it in the git repository of this paper ($git@github.com:daviddoria/vtkHokuyo.git$).

The installation instructions are (these were performed successfully on Fedora 13):

1. sudo yum install SDL* (Hokuyo indicates that you must install *SDL* and SDL_net, but I found I had linking errors until I installed all of the available SDL packages. In fact, if all of the necessary SDL packages are not installed, the remaining steps of the installation do not appear to fail. What happens is only the C libraries are installed. After installing the necessary SDL packages and reconfiguring, the C++ libraries are built.)
2. ./configure
3. make
4. sudo make install

This places the necessary files in /usr/local/include/urg and /usr/local/lib.

2 Details

2.1 Acquisition

The Hokuyo scanner acquires points in a 270 degree sweep at predetermined angles. Therefore, the only thing that is stored is a list of distances (corresponding to the set of angles at which points were acquired.) The provided software provides and *index2rad* function which converts the index of the angle to the angle itself (likely a lookup table). Using this angle and the stored distance, we compute a 2D (x,y) point for each acquired point.

2.2 Establishing a Connection

Establishing a connection to the scanner (/dev/ttyACM0) is done in the vtkHokuyo constructor.

3 Interface

All the user must do is instantiate the vtkHokuyo object and get its output:

```
vtkSmartPointer<vtkHokuyo> hokuyo = vtkSmartPointer<vtkHokuyo>::New();
mapper->SetInputConnection(hokuyo->GetOutputPort());
```

4 Demonstration

4.1 Single Frame

An example output of the vtkHokuyo class is visualized in Figure 4.1. A trained eye will note that this is the profile of a room.

Figure 1: Screenshot

4.2 Video

The provided demonstration code Hokuyo.cpp collects data in a timer loop. We provide video.gif in the git repository showing multiple frames of data acquisition.