CS 378 - Autonomous Vehicles in Traffic I

Week 6a - Kinect demos and PCL
Programming assignment 2

- Less than half the class currently has commit permissions. We need to authorize you using your google account name.
- If you have never used svn before, you may face some problems. Do a test commit before the assignment is due.
  - roscd <your-package>
  - make clean
  - roscd spr12
  - svn add <your-package>
  - svn ci <your-package> -m "initial test commit for the assignment"
- If possible, try this out in office hours. Try not to check in any extra build files.
Today

- This week is about pointclouds.
- In today's class, we will see a couple of Kinect demos
  - To run the demos yourself, you'll need an adaptor. If you bought your Kinect separately from the XBOX, then you probably have it already. You can buy it [here](#) from Amazon. I can spare one or two if someone wants to borrow one.
  - You can't use a departmental machine for this.
- We will go through a high level overview of some of the abilities of the Point Cloud Library (PCL).
Demo 1 - Visualizing the Kinect data

● For this, you will have to run the ROS OpenNI Kinect driver
  ○ Install the Kinect driver on your machine.
    ■ [http://www.ros.org/wiki/openni_kinect](http://www.ros.org/wiki/openni_kinect) (Ubuntu Install)
  ○ Follow the instructions here to launch the driver and visualize the Kinect data
    ■ [http://www.ros.org/wiki/openni_launch](http://www.ros.org/wiki/openni_launch)
● If you run into trouble with any of these steps, then ask one of us in office hours.
Demo 2 - Skeleton Tracker

- Run the tracker
  - [http://www.ros.org/wiki/openni_tracker](http://www.ros.org/wiki/openni_tracker)
- Run rviz and add the *tf* tree to visualize the pointcloud
  - We'll take a closer look at rviz in Wednesday's class
  - We'll have a lecture on the *tf* tree right after the Spring break
Willow Garage held a [ROS 3D Contest](#) about a year ago. There were a number of excellent entries to that contest.

- Unfortunately the code for these entries was not maintained, so now it is difficult to run these live.
- But we still have videos!
Video 1 - Impromptu Buttons

[http://www.ros.org/wiki/mit-ros-pkg/KinectDemos/ImpromptuButton]
Video 2 - Drawable Synthesizer

[http://www.ros.org/wiki/mit-ros-pkg/KinectDemos/ImpromptuButton]
Video 3 - Minority Report Interface

Video 4 - Robot Control

[http://www.ros.org/wiki/openni/Contests/ROS%203D/Humanoid%20Robot%20Control%20and%20Interaction]
Point Cloud Library - PCL

- PCL is a new library devoted to 3D data. It was started by people from Willow Garage.
- PCL is independent from ROS, but can be used through it.
- PCL Homepage:
  - [http://pointclouds.org/](http://pointclouds.org/)
- We will take a look at using some basic PCL code in Wednesday's class by processing some Velodyne data.
- The supplementary slides have been selected from the PCL tutorial that was conducted last July at the RSS conference.