

Week 6:
Oriented Bounding Boxes
& moving to PCL 1.8

Bounding Boxes

- Not too difficult to implement: provided out of the box in recent versions of PCL
- based on the `pcl::MomentOfInertiaEstimation` functionality (in the features sub-library)

- Picks up where segmentation leaves off
- Represented in our codebase by a new BoundingBox data structure

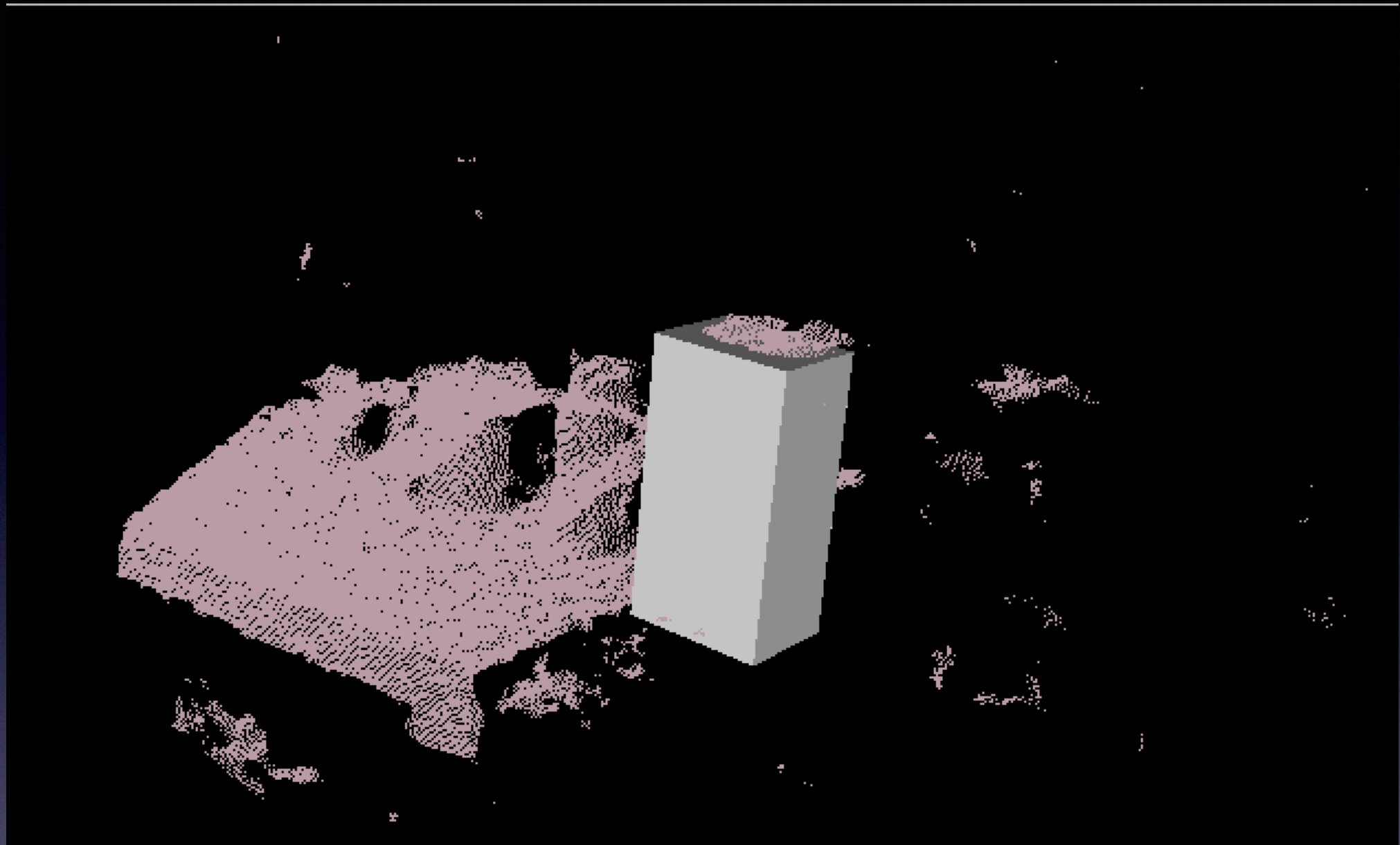
BoundingBox code snippet

```
MomentOfInertiaEstimation<PointXYZ> feature_extractor;
feature_extractor.setInputCloud (this->pointCloud);
feature_extractor.compute();

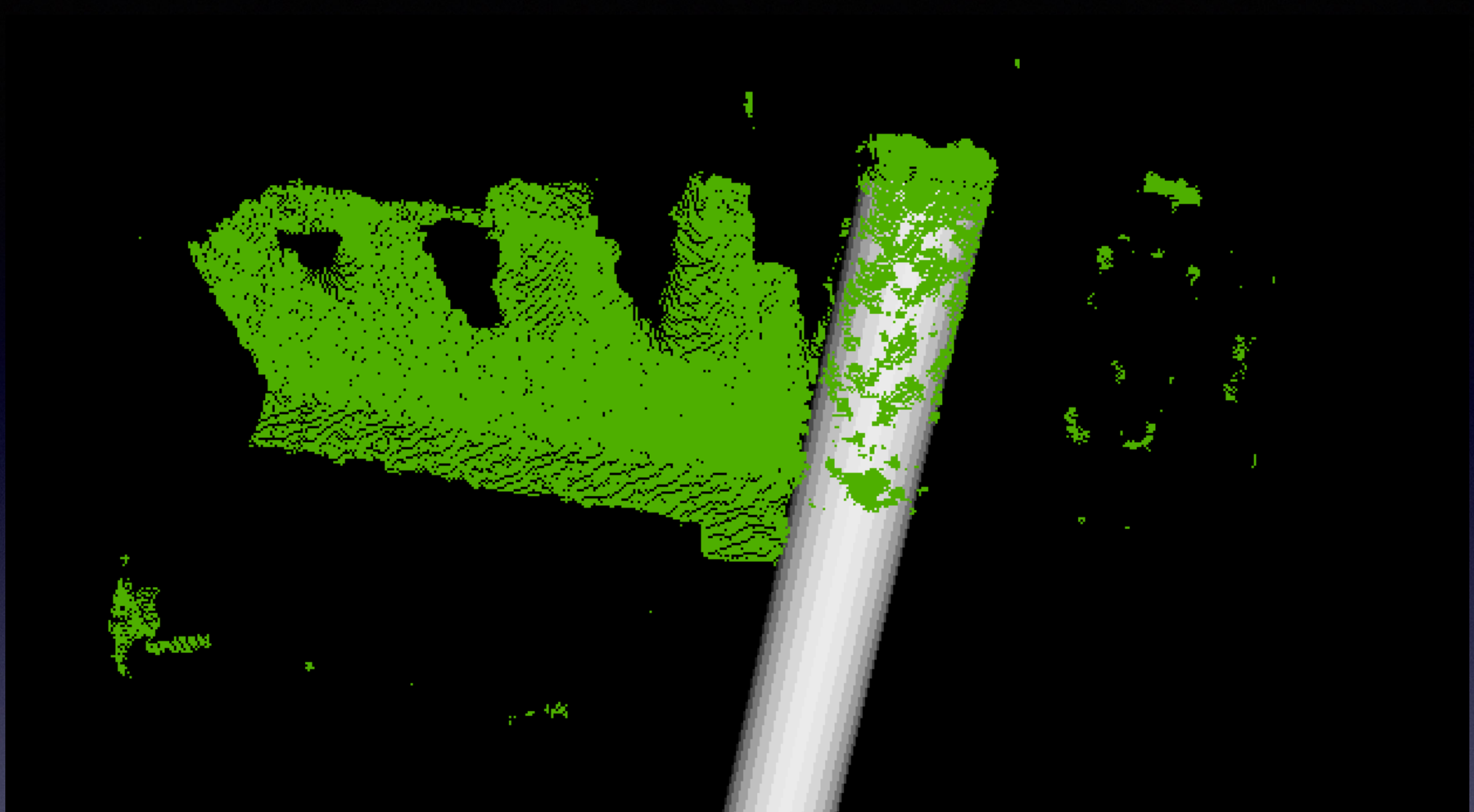
std::vector<float> moment_of_inertia;
std::vector<float> eccentricity;
pcl::PointXYZ min_point_AABB,
               max_point_AABB,
               min_point_OBB,
               max_point_OBB,
               position_OBB;

Eigen::Matrix3f rotational_matrix_OBB;
float major_value, middle_value, minor_value;
Vector3f major_vector, middle_vector, minor_vector;
Vector3f mass_center;

feature_extractor.getMomentOfInertia (moment_of_inertia);
feature_extractor.getEccentricity (eccentricity);
feature_extractor.getAABB (min_point_AABB, max_point_AABB);
feature_extractor.getOBB (min_point_OBB, max_point_OBB, position_OBB, rotational_matrix_OBB);
feature_extractor.getEigenValues (major_value, middle_value, minor_value);
feature_extractor.getEigenVectors (major_vector, middle_vector, minor_vector);
feature_extractor.getMassCenter (mass_center);
```



bounding box for a cylinder



Same image, showing cylinder co-efficients from segmentation, instead of bounding box of cloud

PCL 1.8 Release Candidate

The screenshot shows the GitHub repository page for PointCloudLibrary/pcl. The repository has 9,859 commits, 1 branch, and 26 releases. A red circle highlights the 'Tag: pcl-1.8...' dropdown menu, with a red arrow pointing to it from the top right. Below the tag menu is a 'New pull request' button. The page also shows a list of files and their corresponding changes, including '2d', 'apps', 'cmake', 'common', 'cuda', 'doc', 'examples', and 'features'.

GitHub This repository Search Explore Features Enterprise

PointCloudLibrary / pcl

Code Issues 154 Pull requests 47 Wiki Pulse Graphs

Point Cloud Library (PCL) <http://www.pointclouds.org>

9,859 commits 1 branch 26 releases

Tag: pcl-1.8... New pull request New file Find file HTTPS https://gi

VictorLamoine Merge pull request #1508 from SergioRAgostinho/sift_viewpoint

2d	Fix include in 'keypoint.hpp' (2d module)
apps	Fix VTK preprocessor directives for newer releases
cmake	Fix to force CMAKE to reset QT_USE_FILE variable or it will obtain a ...
common	Preserve viewpoint on sift computation
cuda	Check WITH_* variables instead of *_FOUND and BUILD_* everywhere in
doc	Added note to pcl_visualizer tutorial
examples	Add missing "boost/format.hpp" header
features	Fix Eigen::allocator_type for std::map

PCL 1.8

- Motivation 1: the more features we get out of the box, the further we can get in creating new results for Intel
- Motivation 2: Some tutorials utilize features that are newer than what is in the current binaries
- Side-Benefit: we can debug/step into PCL source code, which will result in better understanding
- Drawback: building takes 30+ minutes on a current machine, and breaks a 4-5 year old machine