**一、pcl配准**

<https://mp.weixin.qq.com/s?__biz=MzU1MjY4MTA1MQ==&mid=2247484425&idx=1&sn=fffa30c88cbd0c51d159fa1ea7d738c2&chksm=fbff2f3dcc88a62b953a95552a3db01e554e341978e1b0165ea342b9765b907396802baed7e7&cur_album_id=1329868938683187201&scene=189#wechat_redirect>

<https://mp.weixin.qq.com/s?__biz=MzU1MjY4MTA1MQ==&mid=2247484425&idx=1&sn=fffa30c88cbd0c51d159fa1ea7d738c2&chksm=fbff2f3dcc88a62b953a95552a3db01e554e341978e1b0165ea342b9765b907396802baed7e7&cur_album_id=1329868938683187201&scene=189#wechat_redirect>

[点云配准，采样一致性初始配准算法，SCA-IA第一篇 - 知乎 (zhihu.com)](https://zhuanlan.zhihu.com/p/66019029)

[火生三昧 - 知乎 (zhihu.com)](https://www.zhihu.com/people/huo-sheng-san-mei/posts)

**二、PCL可视化**

#include <pcl/registration/ia\_ransac.h>

#include <pcl/point\_types.h>

#include <pcl/point\_cloud.h>

#include <pcl/features/normal\_3d.h>

#include <pcl/features/fpfh.h>

#include <pcl/search/kdtree.h>

#include <pcl/io/pcd\_io.h>

#include <pcl/filters/voxel\_grid.h>

#include <pcl/filters/filter.h>

#include <pcl/registration/icp.h>

#include <pcl/visualization/pcl\_visualizer.h>

#include <time.h>

#include "pclfunction.h"

**1.使用CloudViewer类**

pcl::PointCloud<pcl::PointXYZ>::Ptr cloud(new pcl::PointCloud<pcl::PointXYZ>);

if (pcl::io::loadPCDFile("101.pcd", \*cloud) == -1){

PCL\_ERROR("\a->点云文件不存在！\n");

return -1;

}

pcl::visualization::CloudViewer cloud\_viewer("Result");

cloud\_viewer.showCloud(cloud, "cloud1");

while (!cloud\_viewer.wasStopped())

{

}

**2.使用PCLVisualizer类**

//加载点云

PointCloud::Ptr cloud\_1(new PointCloud);//原点云，待配准

if (pcl::io::loadPCDFile("101.pcd", \* cloud\_1) == -1){

PCL\_ERROR("\a->点云文件不存在！\n");

return -1;

}

PointCloud::Ptr cloud\_2(new PointCloud);//原点云，待配准

if (pcl::io::loadPCDFile("102.pcd", \* cloud\_2) == -1){

PCL\_ERROR("\a->点云文件不存在！\n");

return -1;

}

//创建view对象

pcl::visualization::PCLVisualizer viewer("Cloud Viewer");

int v1(0); //创建左窗口显式cloud1

viewer.createViewPort(0, 0, 0.5, 1.0, v1); //左右窗口大小划分，1:1

viewer.setBackgroundColor(0, 0, 0, v1);

viewer.addText("Cloud1", 2, 2, "Cloud1", v1); //窗口下的标题

pcl::visualization::PointCloudColorHandlerGenericField<pcl::PointXYZ> rgb1(cloud\_1, "z");

viewer.addPointCloud<pcl::PointXYZ>(cloud\_1, rgb1, "cloud1", v1);

viewer.setPointCloudRenderingProperties(pcl::visualization::PCL\_VISUALIZER\_POINT\_SIZE, 1, "cloud1", v1);

viewer.addCoordinateSystem(0.1, "input cloud", v1);

int v2(1); //创建右窗口显示cloud2

viewer.createViewPort(0.5, 0, 1.0, 1.0, v2); //左右窗口大小划分，1:1

viewer.setBackgroundColor(0, 0, 0, v2);

viewer.addText("Cloud2", 2, 2, "Cloud2", v2); //窗口下的标题

pcl::visualization::PointCloudColorHandlerGenericField<pcl::PointXYZ> rgb2(cloud\_2, "z");

viewer.addPointCloud<pcl::PointXYZ>(cloud\_2, rgb2, "cloud2", v2);

viewer.setPointCloudRenderingProperties(pcl::visualization::PCL\_VISUALIZER\_POINT\_SIZE, 1, "cloud2", v2);

viewer.addCoordinateSystem(0.1, "input cloud2", v2);

//保留窗口

viewer.spin();

四、PCL文件.pcd格式读写

//点云导入(ascii跟binary格式都可读)

PointCloud::Ptr cloud(new PointCloud);//存放输入点云

if (pcl::io::loadPCDFile("Binary\_1.pcd", \*cloud) == -1){

PCL\_ERROR("\a->点云文件不存在！\n");

return -1;

}

//点云导出

//1.导出为ASCII格式

if (!cloud->empty()){

pcl::io::savePCDFileASCII("ASICC\_1.pcd", \*cloud);

}

else{

PCL\_ERROR("\a->保存点云为空！\n");

return -1;

}

//2.导出为Binary格式

if (!cloud->empty()) {

pcl::io::savePCDFileBinary("Binary\_1.pcd", \*cloud);

}

else {

PCL\_ERROR("\a->保存点云为空！\n");

return -1;

}

五、PCL文件读写