



MagikEye MkE Client Integration Examples

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1 Introduction

MKE integration examples show how to use the MKE point cloud data in these 3rd party libraries:

- PCL (<https://pointclouds.org/>)
- Open3D (<http://www.open3d.org/>)
- OpenCV (<https://opencv.org/>)

2 Instruction for C++

The officially supported target platforms for MKE integration examples are Ubuntu 20.04 / Ubuntu 18.04 running on an AMD64 system. There is one CMake file for all 3rd party libraries, but they are not meant to be compiled all at once (due to collisions of 3rd party library dependencies)

2.1 Dependencies

2.1.1 PCL

PCL and all its dependencies are to be installed.

```
sudo apt install libpcl-dev
```

Installation guide is found in <https://pointclouds.org/downloads/> .

2.1.2 Open3D

Open3D and all its dependencies to be installed. Installation guide is found in <http://www.open3d.org/docs/release/compilation.html#ubuntu-macos> .

2.1.3 OpenCV

OpenCV and all its dependencies to be installed.

```
sudo apt install libopencv-dev
```

Alternatively compilation from source: https://docs.opencv.org/master/d7/d9f/-tutorial_linux_install.html .

2.2 Building

Building should be done from [client/cpp/mkeclient/src/integration_examples](#) directory. Building command sequence is:

```
mkdir build && cd build
cmake .. # Replace this line with one of the cmake lines below
make
```

Turning on the flag MKE_ENABLE_VISU enables creating graphical window with point cloud visualization. By default it is off.

2.2.1 PCL Mode

The PCL mode can be enabled by using the flag `MKE_USE_PCL`. This enables the custom client to receive the point cloud in PCL format.

```
cmake -DMKE_USE_PCL=ON -DMKE_USE_OPEN3D=OFF -DMKE_USE_OPENCV=OFF - <↔>
      DMKE_ENABLE_VISU=ON ..
```

2.2.2 Open3D Mode

The Open3D mode can be enabled by using the flag `MKE_USE_OPEN3D`. This enables the custom client to receive the point cloud in Open3D format.

```
cmake -DMKE_USE_PCL=OFF -DMKE_USE_OPEN3D=ON -DMKE_USE_OPENCV=OFF - <↔>
      DMKE_ENABLE_VISU=ON ..
```

2.2.3 OpenCV Mode

The OpenCV mode can be enabled by using the flag `MKE_USE_OPENCV`. This enables the custom client to receive the point cloud in OpenCV format.

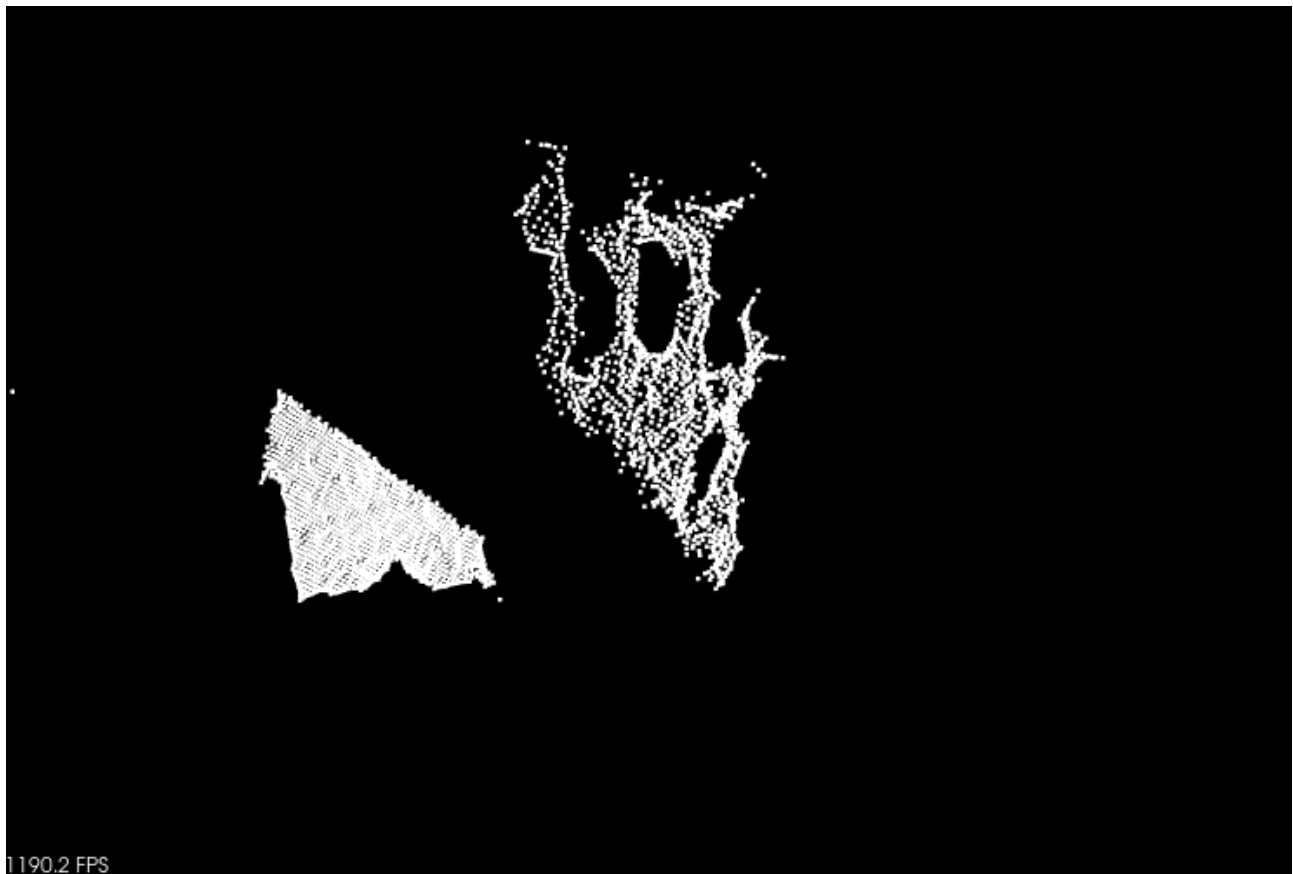
```
cmake -DMKE_USE_PCL=OFF -DMKE_USE_OPEN3D=OFF -DMKE_USE_OPENCV=ON - <↔>
      DMKE_ENABLE_VISU=ON ..
```

2.3 Execution

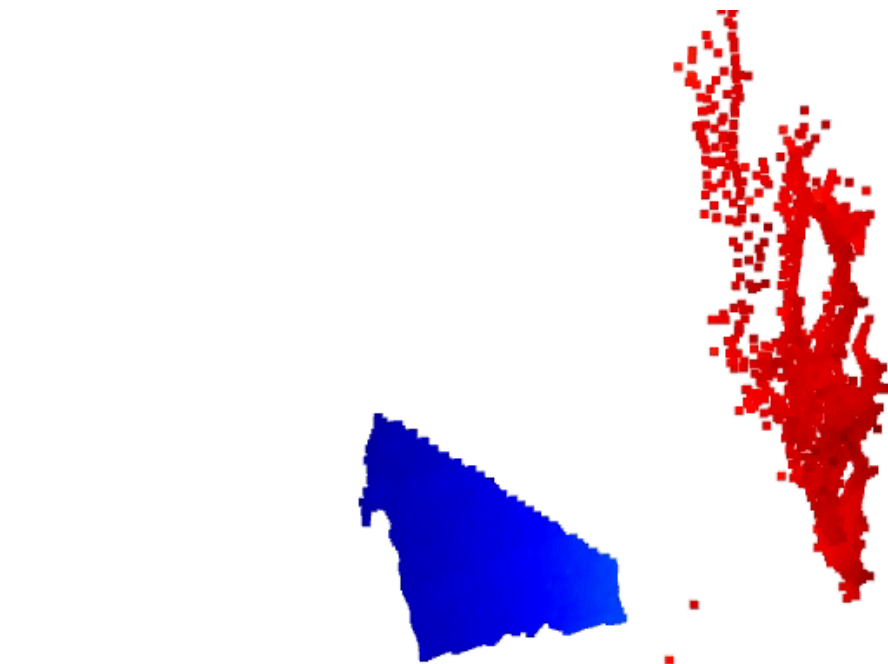
- Upon successful compilation of above cmake configurations, demo binaries can be started using this syntax:
- `client_<XXX>_demo <ip-address> <port>`
- `<ip-address>` and `<port>`: ip-address and port number of the sensor. Port number is optional and by default it takes 8888 port.
- Examples:

```
./client_pcl_demo 192.168.0.105 8888
./client_open3d_demo 192.168.0.105 8888
./client_opencv_demo 192.168.0.105 8888
```

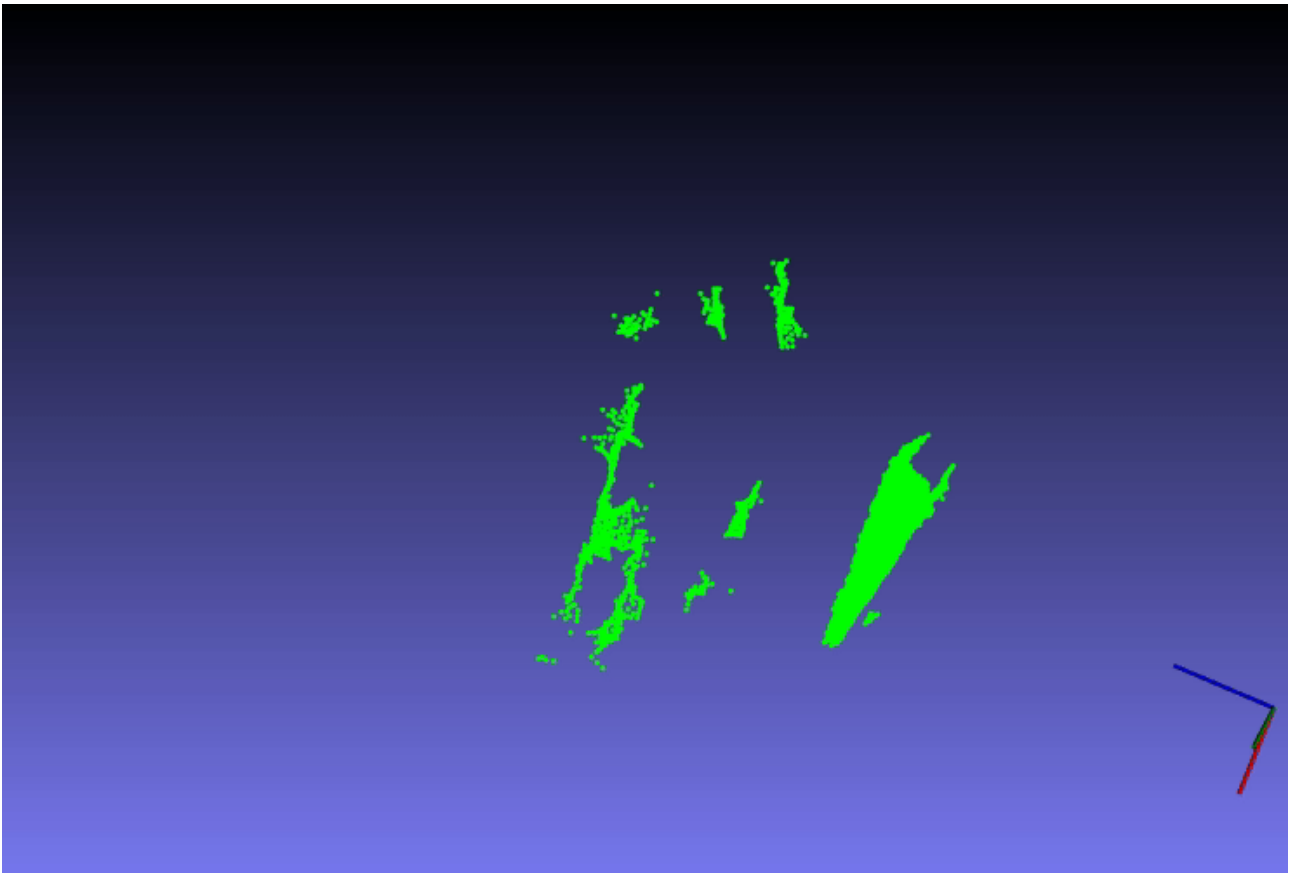
2.3.1 PCL Visualization



2.3.2 Open3D Visualization



2.3.3 OpenCV Visualization



3 Instruction for Python

3.1 Dependencies:

Install all the dependencies as mentioned in the above steps for PCL and Open3D along with python packages for PCL and Open3d.

For PCL install python-pcl PyPI package using the following command,

```
sudo add-apt-repository ppa:sweptlaser/python3-pcl
sudo apt update
sudo apt install python3-pcl
```

For Open3d install the python package using make as mentioned in the installation guide for Open3D.

3.2 Execution

Execute the example files:

- CLI Format: PYTHONPATH=.. python3 <script>.py <ip-address> <port>
- PYTHONPATH: Give the python directory location where pymkeapi exists.
- <script>: Script name

- `<ip-address>` and `<port>`: Provide the IP address and port number of the sensor. Port number is optional and by default it takes 8888 port.
- Example:

```
PYTHONPATH=.. python3 client_pushframes_open3d.py  
192.168.0.105
```