Voxelisation and BEV Object Detection

Dependencies:

- Open3D
- Matplotlib
- NumPy

Code available at https://github.com/stef-andonov/nUWAy-CITS3200

1. Clone the git repository via the link above.
2. Create a Python virtual environment with:

   ```
   python3 -m venv venv
   ```

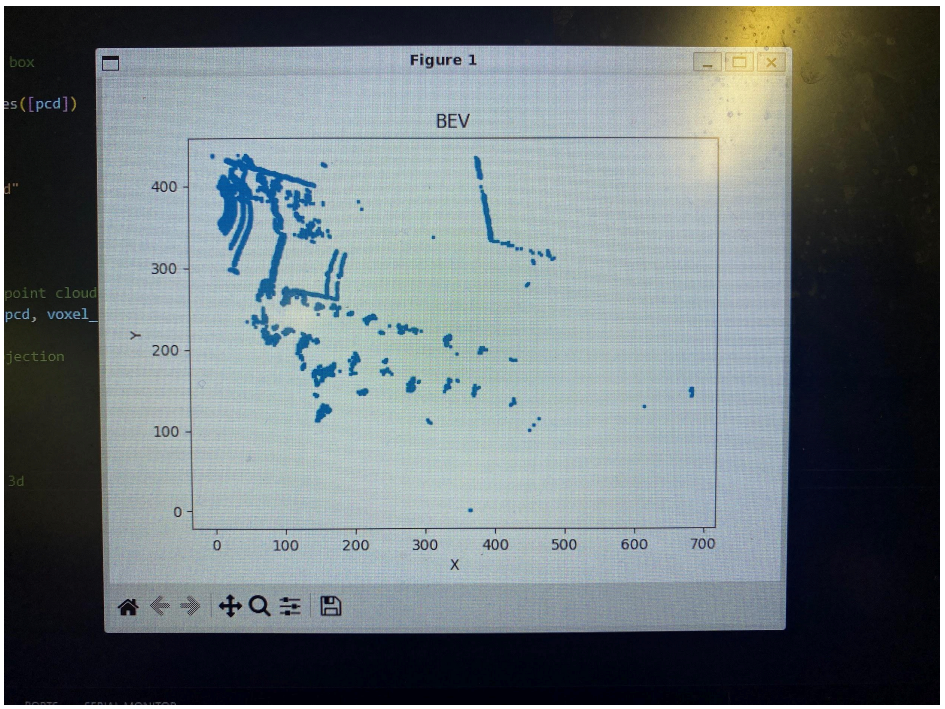
3. Install the required dependencies with the following:

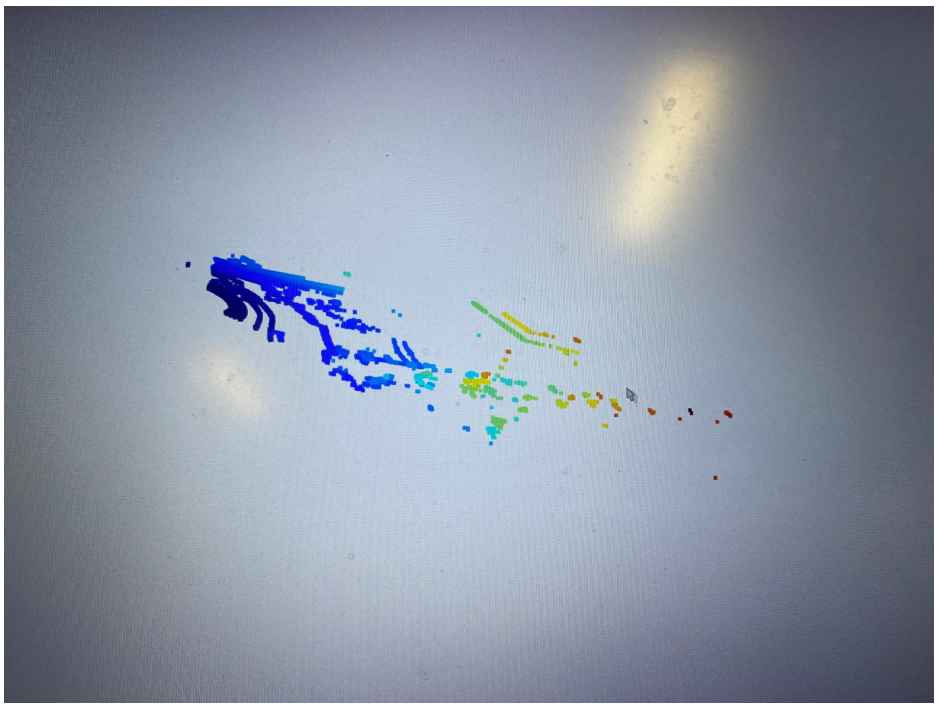
   ```
   pip install open3d matplotlib numpy
   ```

4. Run the bev.py file to show a bird's eye view of the point cloud data then visualise it in a 3-D space. The visualisation can be moved around with the mouse, and its voxels are coloured based on depth.

   ```
   python3 bev.py
   ```

An example visualisation is shown below:

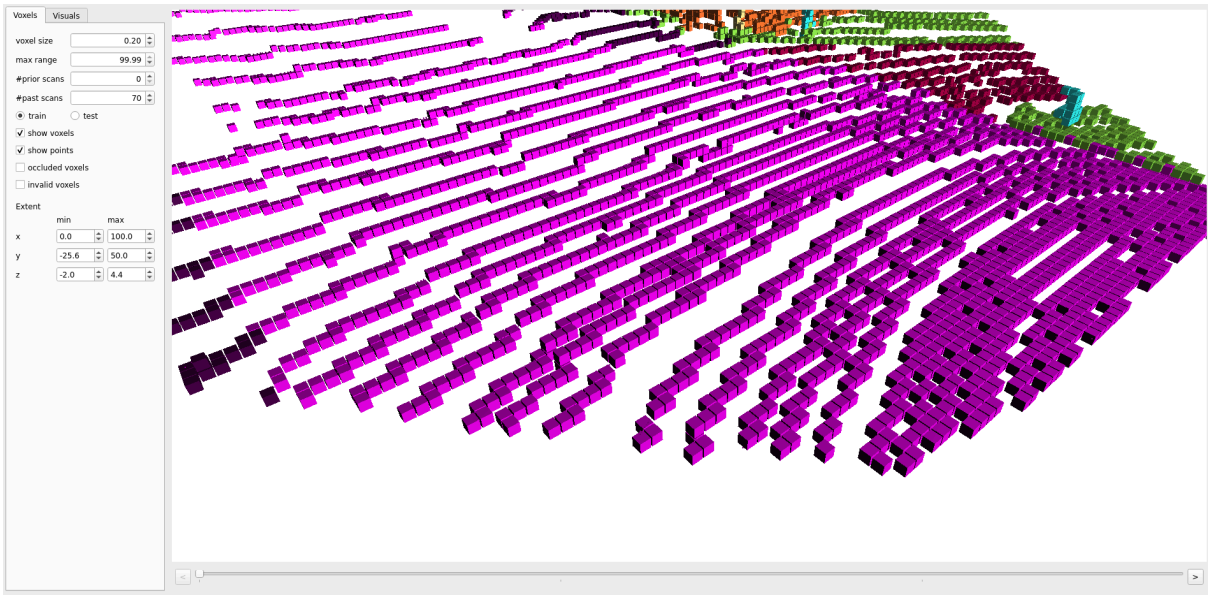




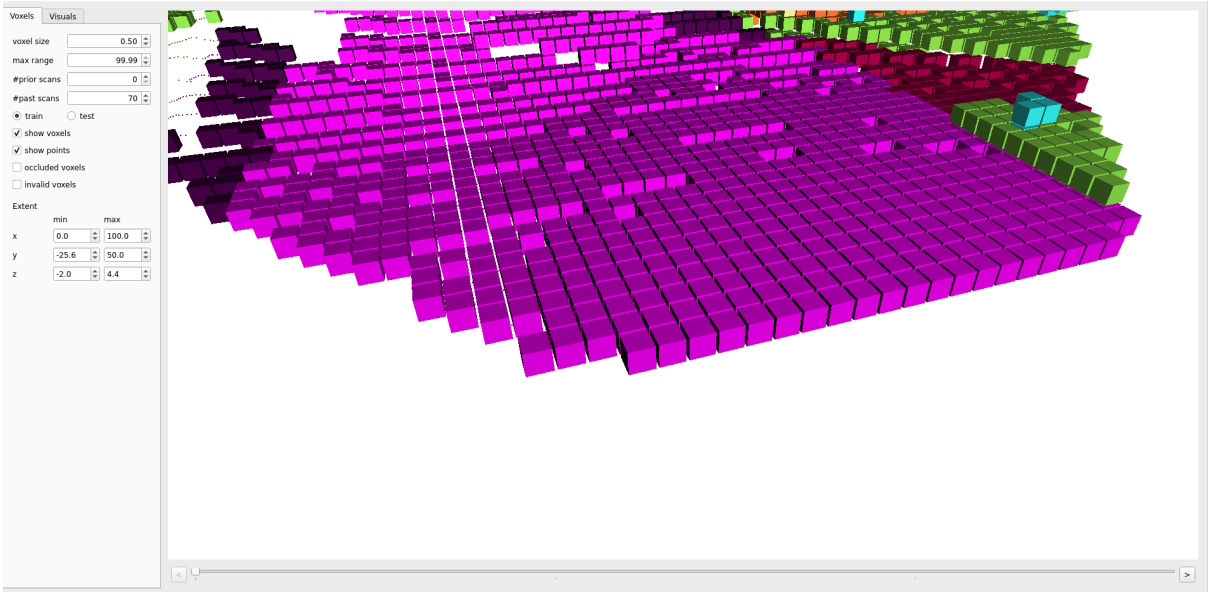
Additionally, the repository at https://github.com/jbehley/voxelizer may be used to visualise voxelised representations of the point cloud data.

The steps to set up and run this program are in the repository README.md file.

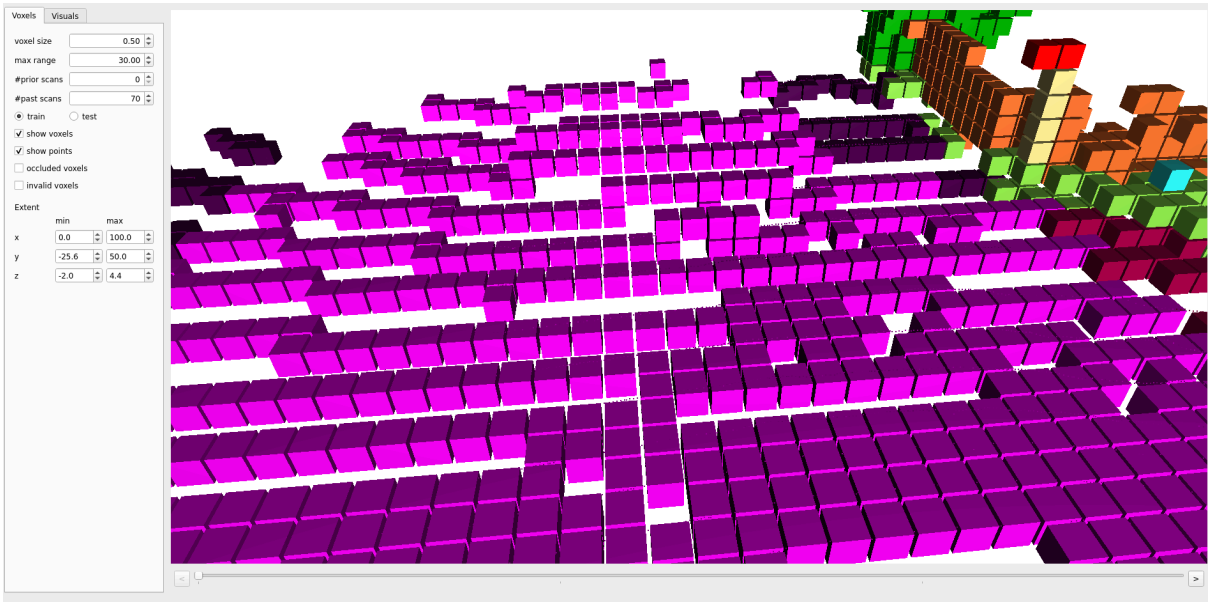
The following images used the pcd_img_data.zip file to generate voxels with this tool, altering parameters in different ways:



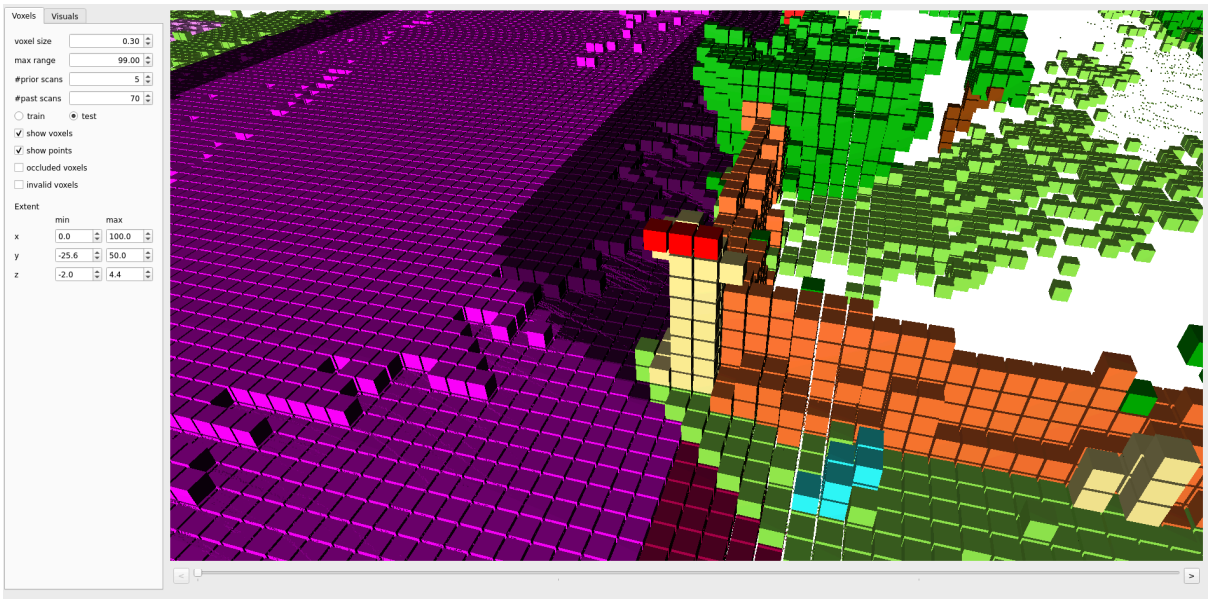
- Default setup



- Increase in voxel size



- Max range decrease (of visualisation)



- Test mode (fills in gaps)