**IF YOU NEED TO TRAIN YOUR OWN DATA, PLEASE FOLLOW BELOW STEPS:**

# Prepare training data

1. Install pcl\_binvox from <https://github.com/dbworth/pcl_binvox>
2. Download the folder “gilbreth\_cnn\_input\_preprocess” to your computer
3. Gathering your training data (PCD files) and save them into:

gilbreth\_cnn\_input\_preprocess/pcd2vox/pcd

1. Under gilbreth\_cnn\_input\_preprocess/pcd2vox run:

sh pcd\_2\_vox.sh

(this step coverts PCD file to binvox file)

1. Edit map.txt to label your PCD data, first column are your PCD files name, second column are labels.
2. Under gilbreth\_cnn\_input\_preprocess/pcd2vox run:

sh covert\_file\_name.sh

(this step embeds training data label into file name)

1. Copy all .binvox files from gilbreth\_cnn\_input\_preprocess/pcd2vox/vox to gilbreth\_cnn\_input\_preprocess/vox2npy/voxmodel/train
2. Under gilbreth\_cnn\_input\_preprocess/vox2npy run:

sh convert\_vox\_2\_npy.sh

(this step converts binvox file to npy file needed by CNN)

# Train CNN

1. Copy gilbreth\_train.tar from gilbreth\_cnn\_input\_preprocess/vox2npy to y*our-path-to-voxnet*/voxnet/scripts
2. Copy gilbreth\_cnn.py from your-workspace/src/gilbreth/gilbreth\_perception/config/ to y*our-path-to-voxnet*/voxnet/scripts/config/
3. Edit gilbreth\_cnn.py, line 21, modify n\_classes to match the class number of your training data
4. Under y*our-path-to-voxnet*/voxnet/scripts run:

python train.py config/gilbreth\_cnn.py gilbreth\_train.tar

1. When training finished (takes several hours), the CNN weight is saved at y*our-path-to-voxnet*/voxnet/scripts/weights.npz
2. Copy weights.npz generated by previous step into your-workspace/src/gilbreth/gilbreth\_perception/config/weights.npz