

Documentation 2: Thursday, 18.01.18

The date for the midterm presentation has been set: Wednesday, 21.02.18, 09:00 - 09:10h.

Current work

orthomosaic_func.m

The function had a wrong mathematical operation when computing indices of a matrix. Thanujan's mapping from cloud points to image pixel indices only worked when the smallest present x value was smaller than 0.

Semantic Segmentation network

In order to use MATLAB for Semantic Segmentation, one has to use a so called pixelClassificationLayer which labels each Pixel with a class. To use a pixelClassificationLayer, the CNN input needs to be a pixelLabelImageSource, which can only be created with a ImageDataStore object and labels for each pixel. The ImageDataStore object only loads specific image formats, all of which only support grayscale or color images. All of these classes only accept grayscale or color images, which needs to be changed. Whether the networks runs with such a modified input function remains to be seen.

Training data format

For a neural network, each input picture needs to be the same size. For now I will just pad all the images up to the same size.

The current training data offers one picture with 41 bands for each class. The pictures have similar sizes, even though they were created from different amounts of points (not scaled correctly). It remains to be seen if this hinders training. Image augmentation and transformation should be included for robustness.

Once this works, I would prefer to label the pixels in the original point cloud, create one big orthomosaic for training and then split it into equally sized training pictures. My motivation for this is that right now the whole orthomosaic is labeled as one class, even though there probably is a lot of soil too.

To do

In order to make the CNN Matlab pipeline work I will need to

- Find an image format to store 41 bands, or maybe use a matrix
- Rewrite the ImageDataStore object to accept 41 band image
- possibly rewrite the pixelLabelImageSource object

When network works: Create new training data