Jannic Veith

Documentation 1: Friday, 19.01.18

Introduction

This Semester Project continues the work of Thanujan Mohanadasan in his Master Thesis „Multispectral Environment Mapping and Inference using Aerial Imagery“. He developed a framework to turn images taken from drones into a 3D-point cloud representation in order to classify various plants. The methods he used tried to classify the data using nothing but multispectral information. In this project I am going to include spatial information using Convolutional Neural Networks and then look for other appropriate methods.

In the first half of the project (8.1.18 - 18.2.18) I am going to work on weakly supervised methods, the second part (19.2.18 - 30.3.18) will be about unsupervised clustering.

Current work

2D Convolutional Network: myCNN

Matlab offers a 2D Convolutional Network method, though it only allows 1-channel (grayscale) or 3-channel (RGB color) inputs. As a first part of the project, I modify the nnet.cnn toolbox function to also accept other channel inputs. This modified function now is in the folder Matlab/myCNN. Calling the modified input layer works. In order to test whether the whole CNN function works, I need multi spectral images as input.

Input orthomosaics:

Since a 2D Convolutional Network needs 2D Images as input, we need to create them from the existing 3D point cloud data. I use the existing orthomosaic pipeline in order to create 41 images for each class.

I created the function „ximeaOrthomosaicsCNN.m“, which calls the function „orthomosaic_func.m“ for each input data point cloud in „thanujan/Datasets/xClassifier/trainSet“. The data in these folders was not uniformly named, so I renamed it. Now every point cloud is called „band*.ply“ where instead of the * there is the band index.

Right now the function that I got from Thanujan is not working. There is a matrix index error, so I need to work out what he intended to do and where the problem is.

To do

Make Thanjuans function „orthomosaic_function“ work.

Run the CNN and visualize the findings.