Web GIS project: Web mapping a photogrammetric product

Photogrammetric Products

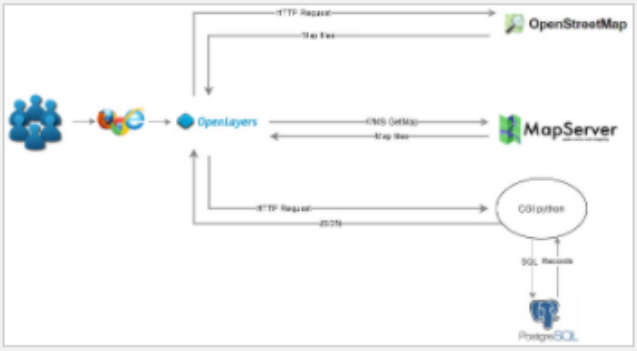
Home Products Quality Contact

Introduction

This website contains two classification images and a Digital Terrain Model (DTM) as the main photogrammetric products. The classified images follow the "Maximum Likelihood Classification" and "Support Vector Machine Classification" algorithm. The DTM is generated for a region in Germany and visualised by overlaying it upon the Open Street Map data.

The workflow of each of the products is briefly described and its quality aspects are discussed. Further, a comparative analysis is drawn to understand the quality of the generated product with the existing ones.

Web Architecture



The website architecture contains two parts: web client and web server.

The client side use OpenLayer to display map tiles and vector data. Server side contains three different servers.

OpenStreetMap is a map server provide a worldwide map which is used as the base map.

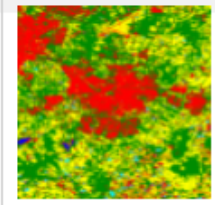
CGI python provide the vector data of the provinces of the Netherlands in JSON format.These data are fetched from the database using queries via CGI python.

MapServer provide the WMS service which contains DTM and Classification images we produced.

Web Map Service Interface Standard (WMS) is a standard protocol developed by the Open Geospatial Consortium. It provides a simple HTTP interface for requesting geo-registered map images from one or more distributed geospatial databases. A WMS request defines the geographic layer(s) and area of interest to be processed. The response to the request is one or more geo-registered map images.

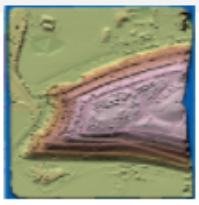
MapServer implements WMS features, it supports the different WMS versions. MapServer has a setting up .map file.This website publishes the photogrammetric products by changing configuration of .map file.Then map server could provide WMS service containing map tiles of our products.

Products



Supervised Classification Image

Two classification images of Enschede, using the "Maximum Likelihood Classification" and "Support Vector Machine " algorithm.



Digital Terrain Model

A digital elevation model using photogrammetric techniques, featuring a region of Germany.

About Us

A platform for featuring photogrammetric products for the geoinformation student community world-wide in association with ITC, University of Twente.

Links & Citations

- Consortium for Spatial Information
- Article on SRTM
- Sentinel-2-L2A Data Quality Report

Organisation

ITC Faculty, University of Twente

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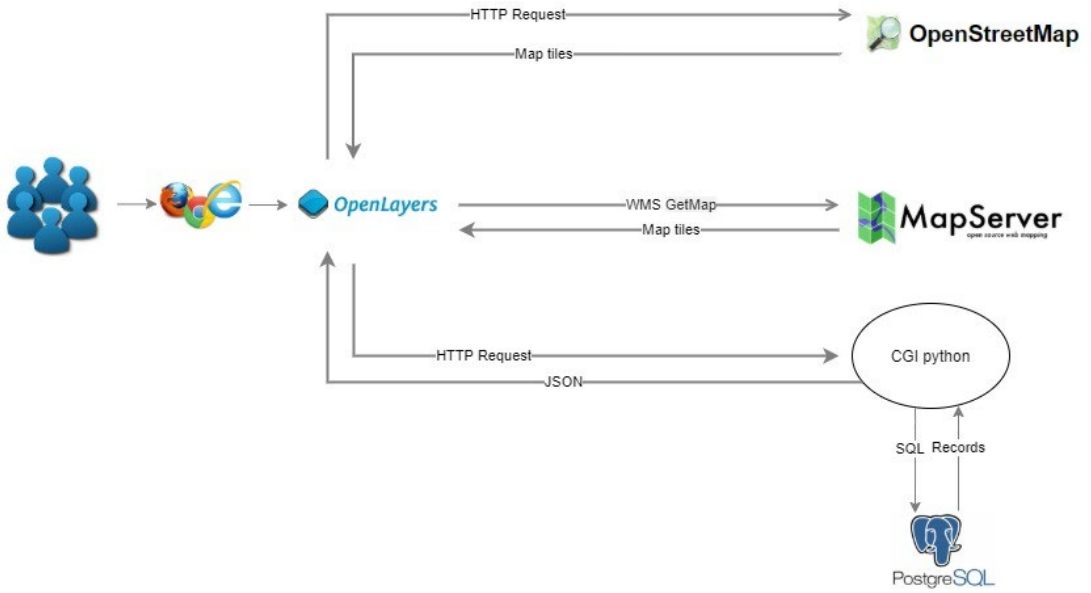
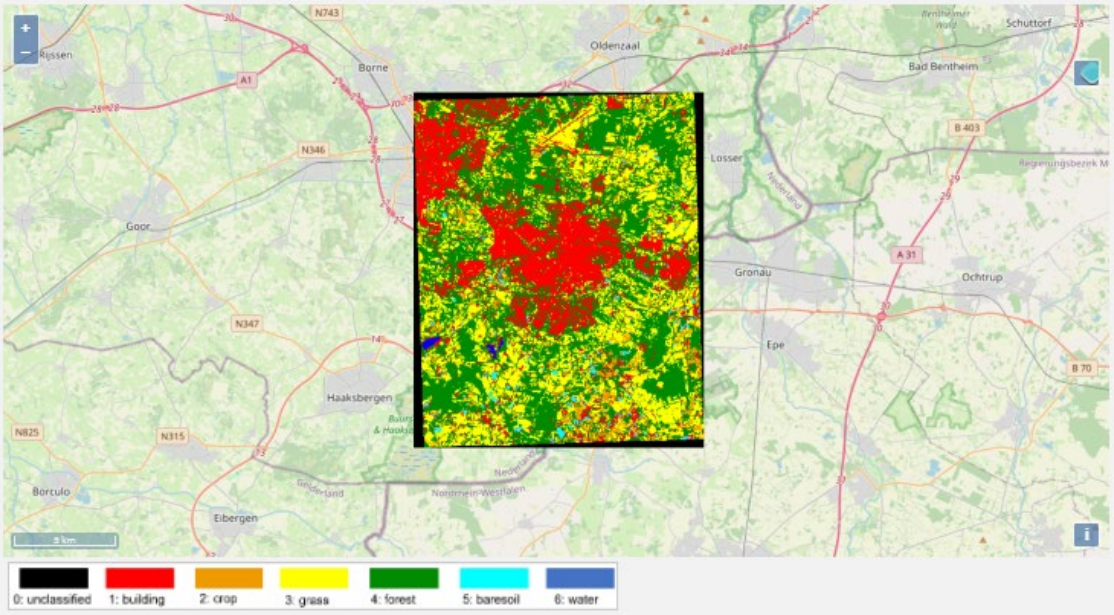


Figure Web Architecture

Classified Image

Home Quality of classification

Land-use Classification of Enschede



Description

The original image that was chosen to make the supervised classification is Sentinel-2A satellite image of Enschede at 25 September2016. 9 spectral bands are used to make the classification, with a resolution from 10m to 20m. Training sample and reference sample are interpreted from the original image. And the pixel-based algorithms of maximum likelihood classification (MLC) and support vector machine (SVM) are used to classify the image. It can then be analyzed for the uncertainty and quality according to the method used and the accuracy report can be generated.

Workflow

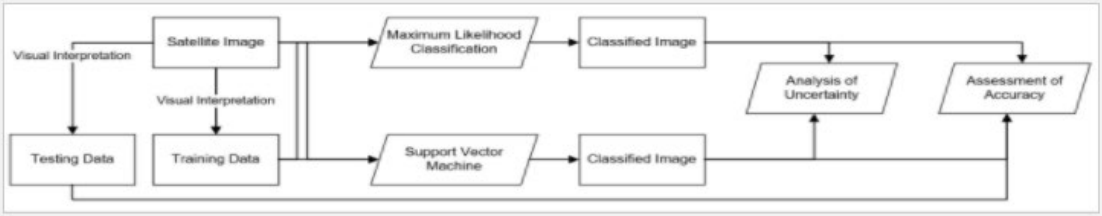


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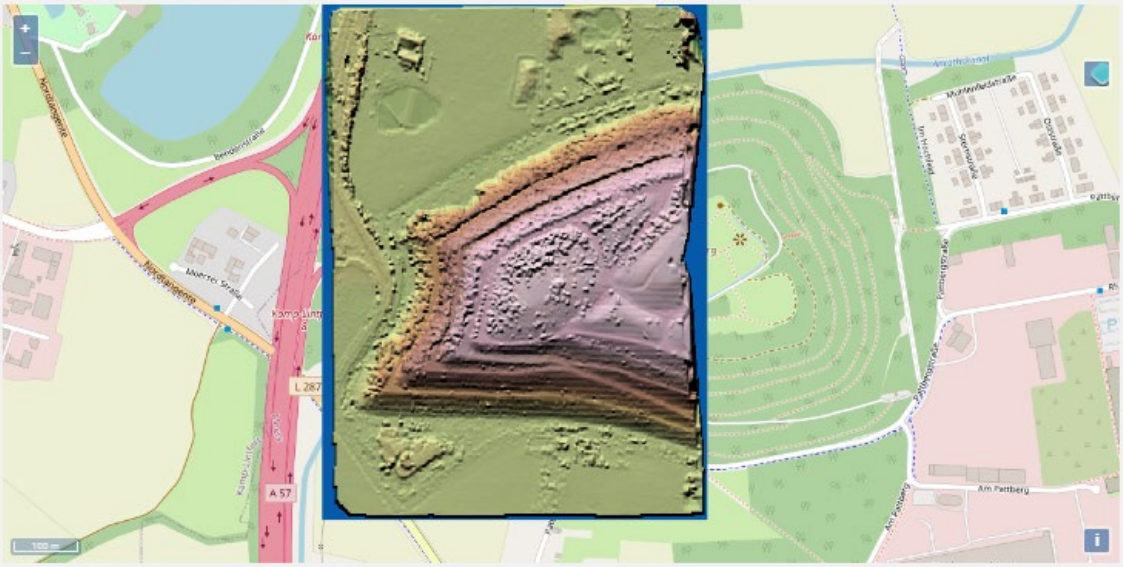
Figure Photographic product1: Classified Image

Digital Terrain Model

Home Quality of DTM

A Digital Representation of Ground Topography And Terrain



Description

Two aerial images were used to do 3D measurement. The mechanism behind this is forward intersection calculated by collinearity equations. The DTM product generated by ERDAS IMAGINE has a pixel size of two by two meters.

The 3D map is a map when it contains stimuli can make the map user think the contents as existing in 3 spatial dimensions. So the map itself is usually not technically 3-dimensional, but with some visualization technique and interaction platform, the user can perceive the map as a 3D map. In this particular assignment, we use the painted and shaded relief to make the DTM seems like 3D. And the depth cues we used are hillshade and color. But the result is not very ideal because the terrain of our study area is not very hilly, and the coverage is relatively small.

Workflow

The DTM product is produced from two aerial images. Before processing the images in the eATE module in the ERDAS IMAGINE, several steps need to be complete. First, the interior orientation part, the purpose of internal orientation, is to reestablish the beam shape of the image during photography. Second, the exterior orientation is the process to get the position of the camera when the image was taken. After these two processes we can use the eATE tool to establish the DTM. And for better visualization, we used the painted relief tool to make the image seems like 3D.

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Figure Photographic product2: Digital Terrain Model