Project specification

CDIO-project
Version 0.2

Status

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CARTOMATIC

Project Identities

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Linkoping University

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1 Introduction and background

With today's technology it is possible to get very high resolution images of the entire earth. This data could be used to create very accurate and up-to-date maps. Creating these maps by hand would be very time consuming and the demand of up-to-date would not be met. There is therefore a need for an automated classification system.

Vricon is an international company that developes photo realistic 3D maps of the globe based on satellite images. OpenStreetMap (OSM) is an open-source project that allows private users from all over the world to add geographic information.

1.1 Aim

The goal of this project is to classify image content in the Vricon maps. Geographic areas such as roads and water are labeled in the OSM data, and will be used to verify the classification of the Vricon satellite images. Statistics of different training parameters will also be presented. The project will result in a training module and 2D maps with classified data.

2 Method

The project will follow the SCRUM model. Each sprint will be two weeks long. After each sprint the work will be evaluated and new stories created. The programming language is separated into two languages, one development language and one product language. The development language is MATLAB to ensure a high workflow. The product language is Python to ensure speed and performance, if MATLAB is within reasonable performance this could be the product language as well. GIT will be used as version control system.

2.1 Approach

The problem will be approached with machine learning. The system will be trained and tested on separate data to avoid overtraining. The data which should be classified is represented in several color frequency images, which can provide different features. Different features should be specified for vegetation and roads etc.

3 Deliveries

The following parts will be delivered at the end of the project:

Training module
The training module is the part of the product which trains the product to find different objects or geographical elements.

Software evaluation and research results
A complete overview of the machine learning performance including confusion matrices and feature space evaluation.

2D map classification
A 2D map containing classified areas such as roads and water.

Website
The website will present the product and the results of the product. An example of a classified map and the related statistics should be included.

Poster
The poster should be a short summary of the website to shortly describe the product.

Presentation
The project presentation is a brief presentation of the product and the results for the customer and other stakeholders.

Project evaluation
An evaluation of how the project with respect to performance and deliverables.