Reflection document – Tom Broersen – 22/06/2016 – TU Delft -- 4418352

In this graduation research, I try to find to what extent it is possible to automatically identify water courses in flat and engineered landscapes, using the AHN3 dataset. Although the resulting product is not perfect (many improvements can be made, as I have identified in my thesis), I clearly show that the proposed prototype has great potential. I am quite happy about the process and planning which I have used during the research. I made good progress at the start of the graduation project, and continued the good progress throughout the rest of the project. I had my methodology and procedure finished in time, so there was enough time left to write a solid thesis. I finished writing the thesis on schedule.

Relationship between the methodical line of approach of the master geomatics and the method chosen by the student in this framework:
There is a clear relation between the two, since I am using a lot of knowledge gained during the Master Geomatics. For example, the use of Voronoi diagrams, triangulation, medial axis transform, and scripting in Python.

Relationship between the conducted research and application of the field geomatics:
As explained above, I use many aspects of knowledge which I obtained in the master Geomatics. The research problem in my thesis (identification of water courses), could be seen as either a Geomatics (what is the location of the water courses?) or a Physical Geography problem (how to characterize the water course network, to use for hydrologic modelling?). However, the solution to the research problem is clearly an application of the field Geomatics. I obtain the solution through the use of many Geomatics concepts, and by writing scripts to automate the procedure.

The relationship between the project and the wider social context:
In low lying countries such as the Netherlands, having an up-to-date and detailed recognition of the network of water courses is crucial for water resources management. The HDSR is responsible for the water resources management in the area around Utrecht, and requires a correct and up-to-date characterization of the water course network in terms of position and dimensions for hydrologic modeling purposes. Their current employed methods are slow, labour-intensive, and subjective. They wish to have a highly automated method to characterize the water course network, allowing faster and less subjective updates. In this thesis, I investigated the possibilities of automatically identifying water courses in these flat and engineered landscapes, using the raw (classified) AHN3 dataset. I found that there are many methods in literature which identify channel-like features, but very few which identify water courses in flat, human engineered landscapes, thus signifying the need for the development of a new method. The present day scientific literature provides no other suitable solutions for the identification of water courses in flat and engineered landscapes using raw LiDAR data. Thus, the methods designed in this thesis fill a scientific gap, and thereby provide a valuable contribution to the scientific community.