Reflection

This thesis addresses the identification of road modality and occupancy patterns with the use of a Wi-Fi monitoring system in a city environment. It investigates which user categories and occupancies can be identified, what the influence of the setup parameters on the final outcome is and proposes improvements that have to be further studied and tested in order to enhance the reliability of the system. The research was conducted from March 2016 to April 2017, along with the data collection procedure. The initial planning included timeslots for literature study, studying the passive Wi-Fi system and its applications, understanding the relevant benefits and limitations, designing the observation network, handling and processing data, and, finally, evaluating and analyzing the results and the setup parameters respectively.

The field of Geomatics Engineering includes practices concerned with the collection, manipulation and representation of information about the built and human environment. Streets contain geographical information which play an important role in numerous areas such as traffic monitoring, land management, public services, and urban development. This thesis focuses on the implementation of the Wi-Fi monitoring system in order to collect useful information about road modality and occupancy patterns, which is required for all the above areas. However, this information is limited as it is significantly difficult to collect.

The chosen method in this research noticeably aligns with the methodical line of approach in Geomatics involving data capture, storage, analysis, and visualization data from different sources, along with quality and representativeness control. The passive Wi-Fi monitoring system has been used in order to collect the appropriate data. As a second step, Postgres was used as the basic tool to store data in a database, process and analyze them with the use of sql queries and Python programming. Furthermore, QGIS and statistic tools were used for the visualization and validation of the outcomes. The conclusions drawn using all the above were examined with regard to the application of the Wi-Fi monitoring system in the research of the spatiotemporal behavior of the different user categories in the city environment as well as the relevant setup parameters which influence the final outcome.

In a wider context, the research and its results are directed towards a system which can provide almost real-time useful information about road modality in the streets of an urban area. Furthermore, formal outcomes about the overall behavior of the total set of users or of each category separately were reached, in this way enhancing the efforts for deeper investigation of people's spatiotemporal behavior. Thus, the method investigated in this research, in combination with the appropriate choice of setup parameters, can significantly support the urban planning and development procedure, leading to the improvement of the level of services.

The final step of this thesis is the investigation of the applicability of the Wi-Fi monitoring system to the computation of road modality and occupancy patterns as well as the influence of each setup parameter on the final outcome. There is definitely a prospect for continuing this research, as there are many technical and procedural problems which are interdependent and have to be studied simultaneously.

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Delft, 2017