Aspects of Representing LiDAR Data Used for Updating

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SUMMARY

Performing environmental spatial analysis requires the collection of base data and special data, subject to the type of analysis in hand, among this data of course LiDAR data can be of much usefulness, in our particular case mobile network data were collected to assess the usefulness of using it for updating some features of the base map that can be used in the future for performing spatial environmental analysis when combined with other special data. The process also contained a task to evaluate a mobile LiDAR instrument that collects laser data besides images in a line ray method that is the quality of which has a direct relation to the speed of the vehicle among other factors. With this collected laser and image data and using the proper software spatial network features were collected that fall in the categories of a provided list or catalog provided by the interested organization, and looking at the results together with the updating frequency, expenses and methods of representation among other aspects.

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1. INTRODUCTION

Performing environmental spatial analysis requires the collection of base data and special data, subject to the type of analysis in hand, among this data of course LiDAR data can be of much usefulness, in our particular case mobile network data were collected to assess the usefulness of using it for updating some features of the base map that can be used in the future for performing spatial environmental analysis when combined with other special data. The process also contained a task to evaluate a mobile LiDAR instrument that collects laser data besides images in a line ray method that is the quality of which has a direct relation to the speed of the vehicle among other factors. With this collected laser and image data and using the proper software spatial network features were collected that fall in the categories of a provided list or catalog provided by the interested organization, and looking at the results together with the updating frequency, expenses and methods of representation among other aspects.

The resulted LiDAR point cloud data combined with images provided a perfect environment for virtual 3D data collections for some of the listed features, but for others difficulties were faced. Thus, the software used provided a perfect environment for updating a part of the listed features, making that a replacement of the conventional land survey and a replacement of conducting expensive photogrammetric projects or at least reduces the number and frequency of flying. In particular manhole features we observed clearly and could be collected and symbolized with a high accuracy, unless they are covered by street objects such as cars which could be solved by methods such as prediction from previously modeled networks, and / or by revisiting the same location in different dates and different times of day, but finally the data were collected smoothly with the possibility to rerecord the updates in a short period of time. Other spatial features of interest were poles, electricity wires, road sides, road furniture, road center lines, pedestrian, main gates, and from environmental aspects, trees, greenery areas, gardens, topography related to water catchment sites, fences, dustbins, municipal objects, etc.
Then, the methods of representation of the data were tested with a software named Geoverse, which by converting point cloud data to special format it allows the easy use of the data without a loss in its, quality, the data could be handled, measurements could be performed, navigation was easy and possible in all directions, including the interior information of buildings if collected. The process starts with converting the data to a format "UDS" which compresses the size to become only 5 % to 20 % of the original data size, which then will be stored in one place and can be simultaneously used by remote access via intranet and internet, and also can be streamed by different users through the network. We could present the data flexibly, measure, fly through in a full resolution, while compression is claimed not to effect quality, the fact which was stressed by our testing, as only those points are removed if they occupy the same space. The computer memory is not overloaded as streaming is performed directly from hard drives using specialized algorithms the software uses, using this format we

overlaid map data with KLMs direct from Google Earth and could overlay data onto our base maps.

Thus, as a final report was submitted the shows the benefits from using mobile LiDAR data from updating some base map features, its quality aspects as compared of previously conventional methods, when it comes to spatial environmental analyses related tasks as an example, but also city planning or any other municipal usage, the report finally showed the benefits of using the proper software that enhance the way of representing the data and using it in an easy good looking 3D data effective model, and that it can be stored in much less space, besides the capability of implementing the so called level 4 which resembles the interiors of buildings.

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