Integration of 3D models with nationwide map information in models for low cost VR technology

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Abstract

In the last decade there has been an increasing attention on making 3D models of the world. Some models are solely made for visualizations (as for example in Google Earth), while other models have a wider use (for example Building Information Models). The amount of 3D information in map data, as for example heights and shapes of buildings, is also increasing.

Norway has been a pioneer country when it comes to the collection and harmonization of geographical information. Today there is a well-organized infrastructure for standardized, nationwide geographical information in Norway.

For many years there have also existed different technologies for the visualization of our environment in Virtual Reality (VR). Common for these kinds of technologies has been the use of quite advanced and expensive equipment. In the last years new and less expensive technologies primarily intended for the gaming industry have emerged. Systems as Oculus Rift are introducing VR for the mass market.

The main objective of this paper is to describe how data from the national infrastructure for geographical information can work together with 3D models of buildings by using Oculus Rift. The paper will answer questions as:

- Which challenges are prominent when using 3D models made for visualization together with national geographical datasets?
- How can 3D models and national geographical datasets be semi-automatic integrated in a virtual reality model?
- How can the navigation in the model be aided by using a map as an element in the virtual reality model?