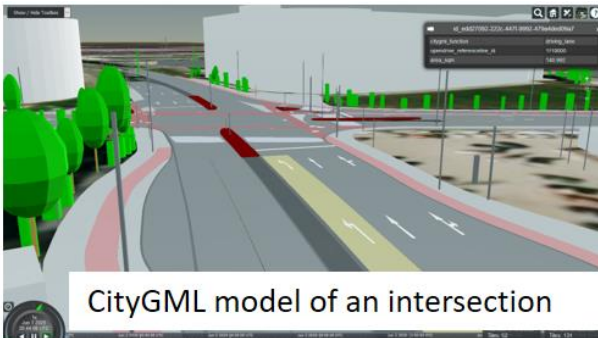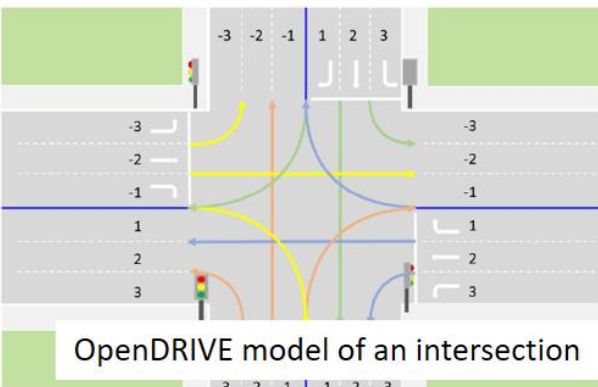**Master's Thesis Proposal**

Interoperability of Streetspace Models for Autonomous Driving – Development of a CityGML-OpenDRIVE Application Domain Extension (ADE)

CityGML model of an intersection

OpenDRIVE model of an intersection

Due to the increased availability of highly accurate data on streetspaces, and growing interest in applications such as autonomous driving, digital models of the streetspace are becoming more important. OpenDRIVE is a standard commonly used in the automotive industry for driving and traffic simulations as well as for testing advanced driver-assistance systems. Streetspace and related objects are modelled with parametric spatial representations.

CityGML is the most commonly used standard for semantic 3D city modelling and also includes concepts for modelling the streetspace. Furthermore, CityGML contains a built-in mechanism for systematically extending the standard with so-called Application Domain Extensions (ADEs).

Interoperability of both standards is complicated since the standards are tailored towards different users and applications and are using different modelling concepts. Thus, exchanging data between geo-information systems and systems used for automotive applications is difficult.

The first task of this Master's Thesis is to conduct an in-depth analysis and comparison of both standards. Based on these findings, a concept for a CityGML OpenDRIVE ADE needs to be developed and realized. The ADE should contain potentially missing concepts, objects and attributes to extend the interoperability of CityGML with Open-DRIVE. An example data set using this ADE has to be produced. Conversely, there are efforts to extend OpenDRIVE with a so-called ,area-model'. This concept needs to be examined and evaluated with regard to its compatibility with CityGML.

Link to the OpenDRIVE→CityGML converter r:trån: https://rtron.io/
Link to CityGML streetspace demos: http://go.tum.de/300369

Organization: Chair of Geoinformatics (TUM)
Supervisors: M.Sc. C. Beil (TUM), M.Sc. B. Schwab (Audi / TUM)
Room: 0772
Tel: 089 289-22579
Email: christof.beil@tum.de