High precision GNSS in autonomous driving
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Introduction
The autonomous car can detect its environment (radar, laser, GPS, computer vision) and navigate without human intervention. Advanced control systems interpret the sensed information and control the car.

The autonomous car and its sensors

The pilot system (CarNav)

- Let us build a quasi-static map into a database, which is independent from the camera system. This subsystem will contribute to the safety of the car controller system, since it informs the moving car about expected traffic tables, pedestrian crossings, traffic lights.
- This increases the security of the car driving system by providing information from two independent sources to the control program.
- If, for any reason, the cameras does not detect significant signs (e.g. stop, one way street, etc.), for example missing traffic tables, which are stolen, or covered be trees, the static map database can fundamentally improve traffic safety.
- Let us store the positions of all the traffic signs, traffic lights, and pedestrian crossings into a map database.
- Let us store the street name, where a certain traffic-table is, where its scope is concerned.
- We also store which graphic symbol belongs to that table.

Business logic of CarNav
Depending on our vehicle’s current position, CARNAV does the following:

- Continually determine on which route we are going. This is a result the following spacial query: which street is the nearest to our current position
- Collect traffic control signals in the around of our current position (e.g. 30 or 50 meters buffer zone)
- The attribute data of the traffic-tables also includes the street name that it refers to, so you can choose from the collected tables which one applies to the road where we are, and which belongs to the cross roads. This is important at a level crossing (right-hand rule)

Technical details

- Maps are in the Postgres / Postgis database manager
- CarNav is a C # application
- Initial Upload of Map Database (Site Trial, Measurement)
- Automatically update table data: if you already have a sufficient number of autonomous vehicles, the map content will be updated based on the data of individual cars

OSM as a possible map database background

The closest traffic-table to our current position can be seen. The table symbols appears if we are closer to this table than a given distance

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References
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