Combined Visual Exploration of 2D Ground Radar and 3D Point Cloud Data for Road Environments

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3D GeoInfo 2018, Delft, Netherlands
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2D Ground Radar Data (GPR)

- Antennas mounted to mobile mapping vehicle
- Four radar antennas with two different frequencies
- Used for below-ground analysis
  - Examination of the road foundations
3D Point Cloud Data

- LiDAR scanners mounted on top of mobile mapping vehicle
- One left-oriented, one right-oriented scanner
- Used for above-ground analysis
  - Pavement condition
  - Road markings
  - Road signs
  - ...

GPR in 3D Point Clouds
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Chart 3
Data Sources

- 2D Ground Radar Profiles
- 3D Point Cloud Scan
- GPS-Trajectory
Combined Visualization

- Place GPR B-Scans as cuboid into 3D point cloud environment
- Translate B-Scan and points located above for better visibility
- "Magic lens" for data exploration in area of interest
Combined Visualization

- Detail view for GPR data
- Slicing B-Scans to explore data inside the cuboid
- Threshold configuration for B-Scans

GPR in 3D Point Clouds
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Chart 6
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GPR in 3D Point Clouds
Future Work: Anomaly Detection

- Automated detection and highlighting of irregularities in radar data
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