

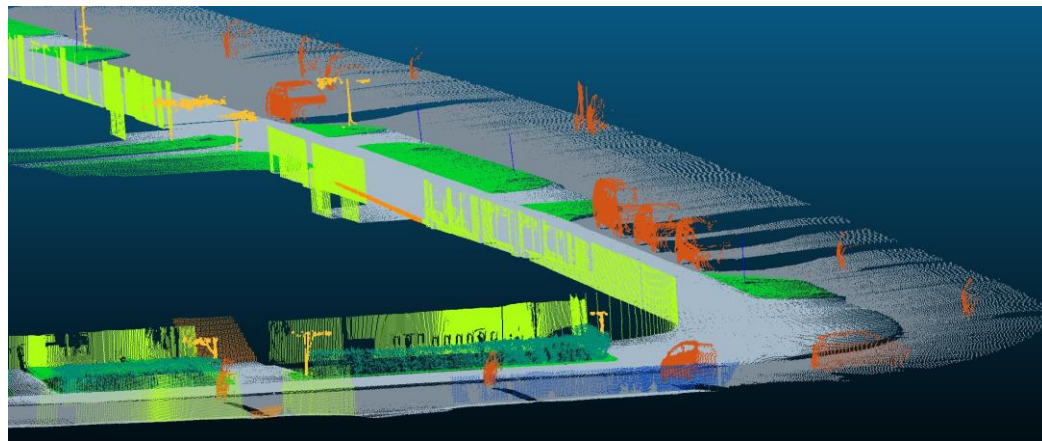
# Generation of semantic rich digital twin from 3D Lidar point clouds

Kristin Eggen

Supervisor: Hongchao Fan

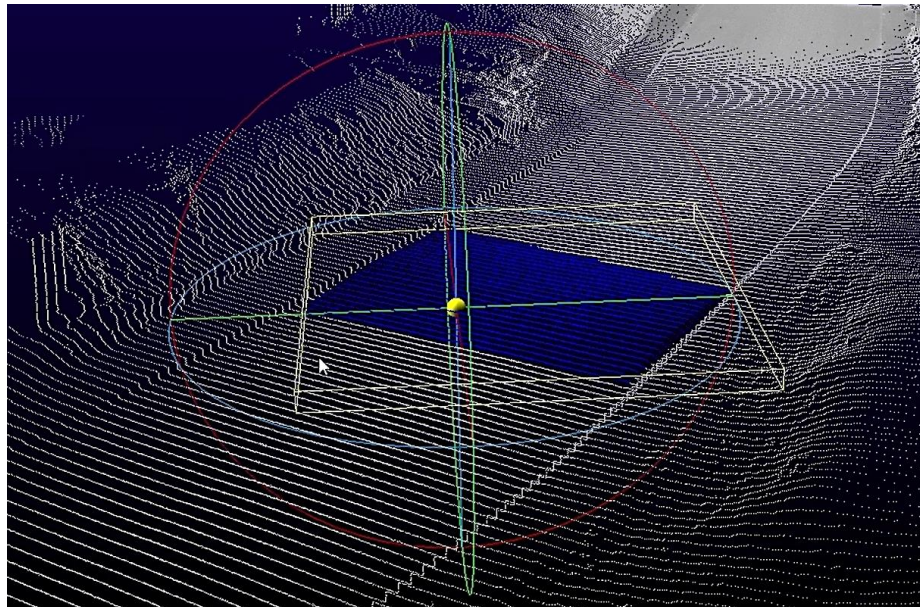
# 2024

- Created a point cloud dataset, using data from Trondheim, for training deep learning networks
- Created a method to improve performance of classification networks
- Paper under review



# 2025

- Speed Bump Detection
  - Autonomous vehicles need to detect speed bumps in order to reduce their speed
  - There are a lot of speed bumps in Norway
  - If the speed bumps are not properly marked, they can be difficult to detect using images and video
  - Point clouds provide geometry information – speed bumps can be separated from the road surface based on elevation differences



# 2025

- Estimating Runoff Volume
  - Using point cloud data to estimate the runoff volume near curbs from sloped road surfaces
  - Can be used to ensure sufficient drainage to reduce risk of vehicles splashing pedestrians
- Road Damage Detection
  - Has been done using images and video, but not extensively researched using point cloud data
  - Compared to images, 3D LiDAR data are less affected by conditions such as weather and lighting
  - Point cloud data can be used alongside images to improve performance of applications
    - Example potholes: 2D images can be used to detect candidate potholes and 3D data can be used to further analyse depth and size

