LIDAR Point Cloud Lane Marking Detection

Vincent Tran
A20396585

Introduction

- The point cloud consists of 430,736 points with latitude, longitude, altitude, and intensity values

- The task is to detect which points belong to the lane markings on the road and to find equations to represent those lanes
  - The intensity values of the lane markings tend to be higher than other points
  - To make this efficient, we need to filter out as many irrelevant points from the dataset as possible

Methodology

1. Transform the LLA point to an ENU point
2. Find the largest plane
3. Find the candidate points for the lane markings
4. Find the line equations for the lane markings

Coordinate Transformations

1. Transform from LLA to ECEF
2. Transform from ECEF to ENU
3. Plot the points

Find Largest Plane

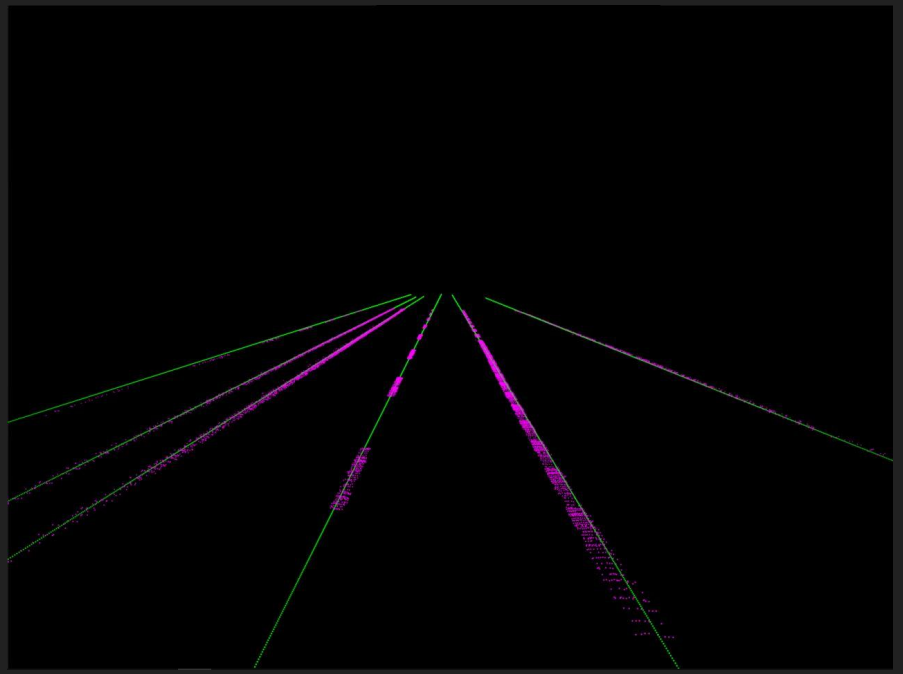
- Use RANSAC to find the largest plane in the point cloud
- Remove all other points

Find Lane Marking Candidate Points

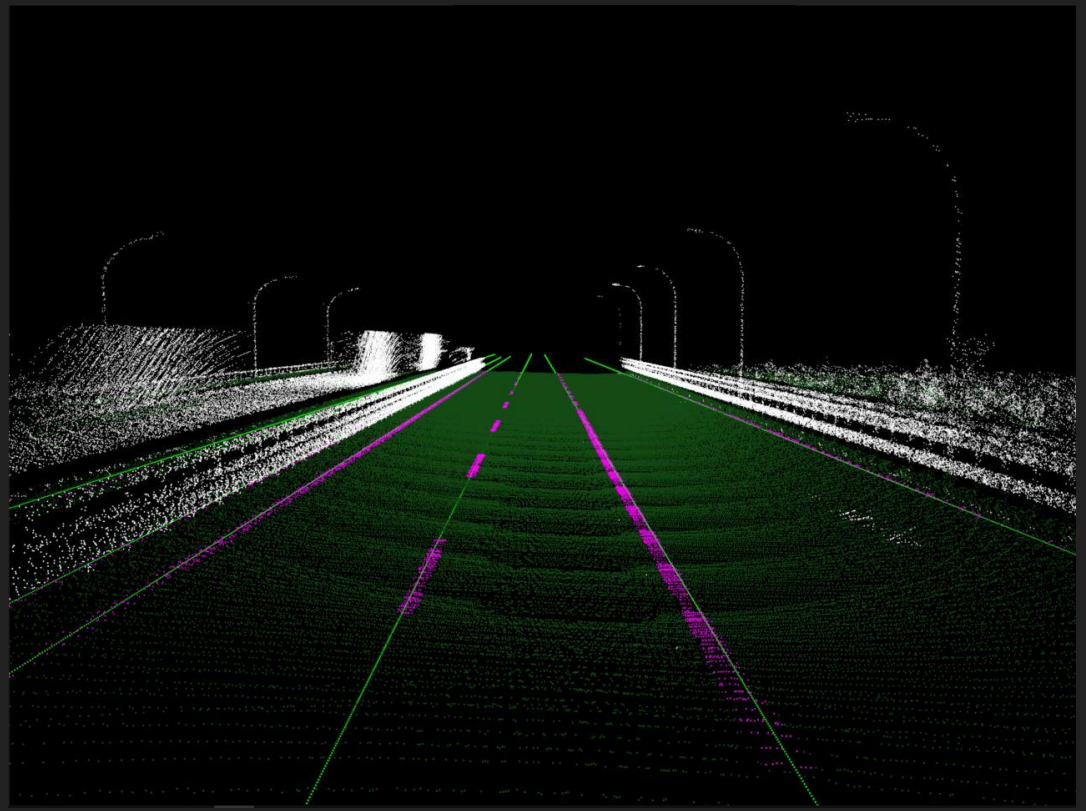
- Filter out points with an intensity value that is higher than 20
- Remove all other points

Find Line Equations for Lane Markings

- Use RANSAC to find all lines in the point cloud
- Remove all other points that do not belong on any of the lines



Result



References

- PPTK Documentation
  https://heremaps.github.io/pptk/