ENGO 500: Geomatics Capstone Project Road Curb Extraction from Mobile LiDAR Data

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Analysis + Conclusion

- Some assumptions made when developing this project are:
 - (1) The terrain is relatively flat; no steep hills/slopes
 - (2) Data is collected in good weather (e.g., curbs are not covered in snow and are clearly visible from the scanner)
 - (3) The curb is relatively uniform throughout the datasets (height, width)
- Greatest challenges:
 - (1) Other features fit the curb detection algorithm. Initially, non-road curbs were also being detected. This resulted in more curbs drawn than intended but were eventually filtered out successfully.
 - (2) Cars parked along the side of the road. Cars block the curb, resulting in a gap of data. This causes the algorithm to draw the curb at the farthest detectable point, which would be the car's side edge, rather than the road edge.
- So, to conclude:
 - The detected curbs are occasionally obstructed by gaps of data due to parked cars. However, the algorithm overall is still able to detect the curb points with decent accuracy and worked for all the example datasets that were provided to us by our mentor.





Figure 4: Earlier attempt of curb detection, where the sidewalk edges were also detected

Note: See Figure 2 for the Curbs detected after refining the algorithm to deal with the first challenge described

Results

on a long, continuous dataset of one urban area.



Figure 1: An example dataset being "cleaned", where the red points are unneeded points to be removed and the grey is the ground area that we want to isolate.



Figure 2: Road curbs detected from the remaining ground points, highlighted in red



Figure 3: Curb points have been vectorized (top), and then overlayed with the point cloud (in red) to show a drawn model of where the curb lies (bottom)

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