

Computer Vision Ride Quality Map

DfT Funding for Innovation 2018

VAISALA

Challenge Statement

Frequent surveying of local authority roads, especially cat 2, 3a & 3b sections is not possible due to the physical and resource demand/availability limitations of existing survey technology.

Characteristics

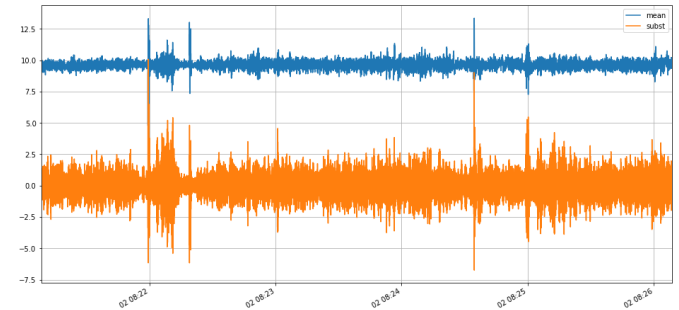
- Big variations in ride quality expected
- Experience ride quality is vehicle dependent



Solution

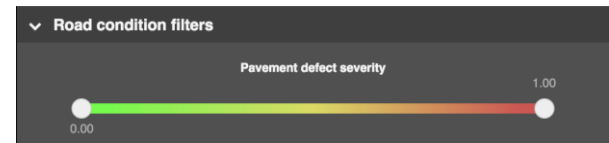
Use ACC to automatically determine pavement failures from video and GPS data.

1. Phone measures acceleration and angular acceleration 200 times/second
2. A signal processing analysis is then derived to estimate sags/bumps/dangerous defects resulting to roughness of the road.
3. Analysis is similar to IRI
 - It is not standardized based on vehicle or speed but by machine learning and a data based baseline



Result

- **Web UI:** Ride quality condition map
 - Quickly locate the areas that require attention
 - Click on a route opens a video for verification and more detailed action planning
 - Severity filters
- **WMS API:** Easily integrate the pavement condition map tiles into your map/GIS software
- **Shapefile:** Get access to underlying vector data



Process

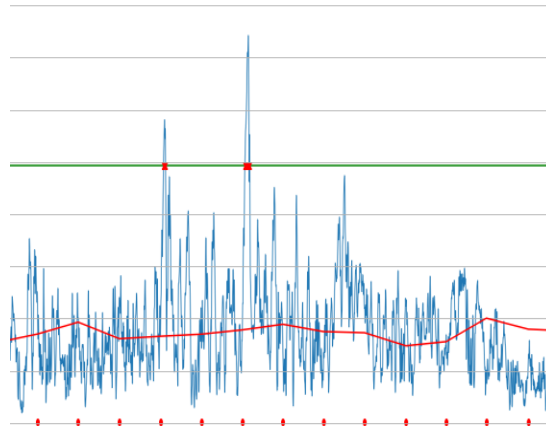
1. Data Acquisition



Existing videos
or images with gps
(<1 m frequency)



2. Accelerometer Signal Processing



3. Get Results and Take Actions!

