

Road Roughness Analyzing System

5th Semester Mini Project



Supervised By

Dr. Vijay Kumar Chaurasiya
IIIT Allahabad

Group Members

Mudit Rathore ICM2015502

Vaibhav Agnihotri LIT2015007

Mudit Dubey LIT2015006

Improvements

After going through Mid-Semester Presentation, we realized that our project was way too much expensive because of number of devices and equipment used and this wouldn't be a better approach for pavement survey of rural/district roads. After some research work, we came to the point that our area of interest is only rural/district roads as there are already pavement surveying systems for highways. So, if we just remove the facilities which we were providing for roads like expressways and highways and only focus on rural and district roads, cost can be reduced.

Too many things are there which are not required to be measured for rural and district roads like no road superelevation is there, small cracks and potholes being ignored don't need to be considered as an error in this case because these are rural roads. We're only bothered about road condition, if there is a 2-3 inches minor crack or something like that, we can't say that this road is in bad condition and patch-up work is required. Finally, conclusion is that accuracy is not that much required as that in case of expressways/highways.

Road Traverse Profile-

Component which was contributing in the cost most was laser sensors with a quantity of 8. We required 8 lasers to make the road traverse profile precise and accurate in real time. Since, we're not much bothered about accuracy now. Pothole detection through image processing would be a better option. Still the point is that how to examine complete width of the road in a single run. After performing some experiments, idea which comes to my mind is to use ***GoPro Camera*** at the windshield and analyze the complete width through HD images from the camera because that is the point where the driver gets the complete view of the road. Images from the camera will include the complete width of the road a few meters ahead. Only thing which causes problem in this case are obstacles like traffic. Since we'll be evaluating a single square block of the road through multiple frames, minor traffic can be allowed and chances of error will be very low.

Depth Measurement-

After detecting a pathole/crack a few meters ahead from the analyzing device we need to measure its depth. Since we already got the location of pathole we only need to evaluate that particular part which can be done via *one or two Laser Scanners* mounted at bottom.

Data Updation-

Finally, we need to update patholes positions for road maintenance and future work which can be done via creating a custom Google Map with our patholes positions recorded. To get the position (latitude/longitude) a *GSM/GPRS Module* will be required. Roughness index of a particular segment of the road can now be calculated via no of cracks/patholes and their recorded length/depth in that particular segment.

In this way *Road Roughness Analysis* process for rural/district roads will be cost effective and error controlled as well.