

SIRWEC Abstract – Road condition classification using a combination of sensors

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Today several optical sensors for road condition monitoring for vehicle mounting are available on the market. What most of them have in common is that they only measure on a small area of the road. In road winter conditions the road condition can change from dry to snowy perpendicular across the road. The wear and the heat from the vehicle tires cause this effect. So if the vehicle mounted road condition sensors only measures in the tire tracks they will give a wrong classification of the overall road condition.

In mobile phones and also modern vehicles there are cameras that takes pictures or even video of the road ahead of the vehicle. By combining such images or videos with an optical road condition sensor a much better image of the current road condition could be presented.

In this approach the vehicle mounted sensor Road eye is combined with a dash camera application for an iPhone to show the potential of combining the two sensors. By utilizing the three intensities in the Red Green and Blue (RGB) image in combination with the road condition classification from the Road eye sensor it is possible to get a classification of the entire road lane. As the Road eye only classify a area of around 1 cm but with a high frequency, 20 Hz, a line in the image from the camera can be used as a reference to separate different road conditions across the road lane.

This investigation focuses on post processing with the intent of enabling a technology that gives the road maintenance entrepreneurs a possibility to click on a symbol on a map to get an image of the latest road condition classification for that specific position. The image will contain not only an ordinary RGB image but also a color-coded image of the current road condition.

The result of the investigation is a video from real measurements done in Norway covering the road conditions dry, wet, icy and snowy asphalt both across the lane as along the lane.