

A basic study toward the establishment of Weigh in Motion

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Abstract

It is desired to make it realize to measure the weight of vehicle running on traffic lane with practical accuracy and reliability without making it stop. More clearly it is desired to establish the systems to measure each axle load of vehicle on road. Because it is important from the viewpoints of road damage protection, traffic safety and high efficiency of monitoring. This type of the vehicle weight measurement is called “Weigh in Motion”.

In this paper, the authors show some requirements provided by a Japanese expressway company for the measurement system at first, and then present a basic investigation regarding the measured signal obtained using a miniature measurement device which is designed for the axle load of motorcycles. The authors present the basic mechanism of the current measurement device and the ideas for signal analysis by showing data and result obtained by experiments using a motorcycle's load.

Such measurement devices are to be placed in traffic lanes with the condition of setting the level of the measurement platform almost same as the lane surface. The sensor signal consists of not only static axle load of vehicle but also dynamic load due to vehicular movement and vibration, and moreover shock at the moment when wheels get on and off the measurement platform. The time for each axle being on the platform of the measurement device is very short, i.e. a fraction of second in general conditions. Therefore, it is an academic interest to identify the axle static load from the sensor signal in such actual conditions with practical accuracy.

The authors hope productive discussion for development of the research on Weigh in Motion in ICoVis2018.