

TRAFFIC SURVEILLANCE USING RADAR INTERFEROMETRY

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ABSTRACT

Most of the fatal accidents occur due to over speeding and to bring down accidents is strict enforcement of speed limits. In India, various steps to enhance road safety such as road furniture, road markings/road signs, introduction of Highway Traffic Management System using Intelligent Transport System, and enhancement of discipline among contractors during construction, road safety audit on selected stretches, have been undertaken by National Highways Authority of India. Traditionally, this task has been partially solved using radar and/or laser technologies radar guns, laser or LIDAR guns etc., and, more recently, are using video-camera based systems. All these systems have significant shortcomings that have yet to be overcome.

The main drawback of the laser gun is “instant on”, meaning the gun isn’t detectable at all times, only when it’s directed to the car. The second the beam hits car, the laser instantly reads speed, and that’s what causes the detector to beep. It doesn’t measure the top-speed. Novel video-camera systems, based on license plate identification, solve the previous drawbacks, but they have the problem that they can only measure average speed but never top-speed. This paper studies the feasibility of using interferometric linear frequency modulated continuous wave radar to improve top-speed enforcement on roadways. Two different systems based on down-the-road and across-the-road radar configurations are presented. The main advantage of the proposed solutions is they can simultaneously measure speed, range, and lane of several vehicles, allowing the univocal identification of the offenders.

KEYWORDS: Automotive Radar, Road Traffic Control, Vehicle Traffic Detection