

Effective Tracking System For Transportation

M.Rajnikanth

*Assistant Professor, Department of Mechanical Engineering
NSIT, Salem, Tamilnadu, India*

K.Kiruthiga

*Student, Department of Mechanical Engineering
NSIT, salem Tamilnadu, India*

G.R.Ramakrishnan

*Student, Department of Mechanical Engineering
NSIT, salem Tamilnadu, India*

S.Senthamizlan

*Student, Department of Mechanical Engineering
NSIT, salem Tamilnadu, India*

Abstract - Generally, checking of transportation of illegal materials especially in roadways is a tedious task. Due to which these activities go unchecked many a time. Checking is basically done by the officials who control illegal transportation of banned goods entirely based on suspicion. The objective of this paper is to use latest scanning technology to curb illegal transportation of banned goods to greater extent with minimum involvement of human thereby making the process simpler and effective.

I. INTRODUCTION

The scanning Technology for the purpose of curbing illegal transportation of banned goods is millimeter wave scanner. Millimeter wave scanners use non-ionizing electromagnetic radiation similar to that used by wireless data transmitters, in the extremely high frequency radio band which is a lower frequency than visible light. Millimeter wave scanners come in two varieties: active and passive. Active scanners direct millimeter wave energy at the subject and then interpret the reflected energy. Active scanners used in airports for scanning human body functions in a way such that the millimeter wave is transmitted from two antennas simultaneously as they rotate around the body. The wave energy reflected back from the body or other objects on the body is used to construct a three-dimensional image, which is displayed on a remote monitor for analysis. Passive systems create images using only ambient radiation and radiation emitted from the human body or objects. Due to reasons well known active scanners are preferred for this purpose.

Clothing and many other materials are translucent in some EHF (millimeter wave) radio frequency bands. This frequency range is just below the (related) sub-millimeter terahertz radiation (or "T-ray") range.

II. EXPERIMENTAL SETUP

The scanners are setup on the top of the toll gate such that entire vehicle while passing through the gate is scanned. The general toll gate set up is described below.

In toll gates there are two lines. The first line is known as AVC line which is an abbreviated form for Automatic Vehicle Classification. The distance between these two lines is 90 inches. These two lines are connected with the sensors and also with the cameras.

The sensors are used to find out the type of vehicle which crosses the toll gates. Actually, this line is mainly used for automatic gate close. The gate opens during the bill transition. The gate opening and closing system is retained for proper scanning.

The millimeter wave scanner is fixed horizontally in the toll gates. When considering the height of the millimeter wave scanner in toll gates, the maximum height of the vehicle which pass through the toll gates are upto

16 feet. Since the height of the lorries and trucks are upto 16 feet, it is proposed to fix the horizontal millimeter wave scanner at a height of 18 feet.

Since the size of the vehicles would be different, sensors can be used to detect the start and end of scanning process along with height adjusting arrangement. This will improve the quality of the image of the loads and goods which are carried by the vehicles.

Including scanners, the odour detecting machine must be provided in all scanning booths particularly positioned at suitable height for easy odour detection to avoid drink and drive.

The scanners are of cuboid shape and modifications can be done to suit different size of the vehicles that are scanned such as trucks, cars, private bus etc. Also sensors can be used to detect the start and end of scanning process

Including scanners, the odour detecting machine must be provided in all scanning booths to avoid drink and drive .

III. COMMUNICATION SYSTEM

Proposed communication system to control illegal transportation of banned goods would require a dedicated server with internet connectivity for transport system and website wherein the transport agencies can login and fill in the details like source and destination, type of loading materials, quantity, driver and cleaner information etc which would enable the officers to look into these information while scanning and whether the vehicle has passed through the same route as specified and has been scanned in the tollgates existing in the route.

Since scanning system is used in toll gates, the purpose of communication system setup is to pass the scanned information from the scanner booth of one toll gate to another toll gate through which the vehicle will pass. This communication system setup can be done by networking process. Basically, networking is the process of two or more computers linked together to transfer data and information. To transfer small data and information SIM cards in mobile phones are used. But since data is large, a dedicated server with internet connectivity, will help transfer information from one toll gate to another along with the route the vehicle has to pass through, along with scanned image of the loads and goods that are carried by vehicles and other details.

IV. PRIVACY AND HEALTH CONCERN

The use of millimeter wave scanner was banned due to privacy and health concerns. As the technology is useful for scanning, care has to be taken to maintain privacy of individuals. So, sensors must be provided to sense human beings so that the scanning process stops and continues from a point where there are no human beings. If in case while scanning if a human image appears, provision should be made to automatically blur the image.

V. CONCLUSION

Millimeter wave scanners operate in the millimeter or sub-terahertz band, using non-ionizing radiation, and have no proven adverse health effects, though no long term studies have been done. Though effectiveness of Millimeter wave scanners have been questioned with respect to detection of threatening objects in wet conditions but since it can penetrate through cloths which are used to cover the load in the vehicle as clothing and many other materials are translucent in some EHF (millimeter wave) radio frequency bands and this frequency range is just below the (related) sub-millimeter terahertz radiation (or "T-ray") range its a scanning technique that can be relied on with proper technical changes as per the requirements.

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