DETECTING OVERLOADED VEHICLE TO ENSURE SAFETY ON ROADS

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Technology has been advanced in all aspects but still overloaded vehicle is a challenging issue in public transport systems. Vehicle which carry heavy load pose threat to human life span and also cause excessive wear and damage to road, bridges, pavements and also make the vehicle less stable. The large volume of vehicle on roads has been a challenge to authorities and manually monitoring them is practically not possible. There arises the need for an entirely automated surveillance system. In Intelligent transportation systems, automated vehicle detection plays an important role in detecting overloaded vehicle, identifying abnormal or suspicious behavior of vehicle, traffic congestion, and counting the number of vehicles for traffic analysis and security. Video surveillance technologies are being improved to provide information about vehicle velocity, traffic counting, presence detection, headway measurement, vehicle classification and weigh-in-motion data. Surveillance systems also help in extracting information about the vehicle such as vehicle body type, tire size and trajectory dynamically. The main objective of this research is to automatically detect an overloaded vehicle in real time using surveillance cameras installed in vehicle. The research mainly concentrated on school vans which carry children exceeding their limit.

The research objective is accomplished by determining the number of passengers inside the vehicle using face detection algorithm. This count is compared against the allowed count for the

vehicle which is retrieved from the database. An alert message would be sent to the server along with vehicle number captured by the surveillance camera, if the number of passengers detected exceeds the allowed count. The authorities could track the vehicle using GPS information and the other details about the vehicle could be retrieved from the database itself.

The proposed solution performs quite well but would need adaptations before being able to run on embedded hardware. This research experiments only one type of vehicle and this could be extended to classify all types of vehicles including private and public vehicles with minimal modification. The future enhancements also include identifying whether a passenger is wearing seat belt or not and also in trying other robust methods for detecting faces automatically.

The major contribution of this research to society is detecting overloaded vehicle automatically and helps in preventing accidents which is one of the critical reason of road accidents. Sometimes the driver may not be aware whether his/her vehicle is overloaded. The algorithm proposed in the research work would counts number of passengers in a vehicle automatically using face detection method and would give an alert to the driver or authorities if the count exceeds. This would help the authorities to take precaution against road accidents which are caused by overloaded vehicle and also make our road infrastructure safe. Human lives are precious and roads are our blessing, so keep it safe for better travelling and transport.