

Chapter 1

INTRODUCTION

1.1 Introduction

A significant goal of Artificial Intelligence research is to reduce human loss of life and injury. In principle, intelligent systems can warn humans and protect them from potentially dangerous situation. Evolutionary algorithms have the potential to identify danger where it might otherwise not be apparent by learning about dangerous situations through experience. Artificial neural networks are evolved to warn drivers in principle learning may eventually help save lives.

If cars could warn their drivers that a crash is imminent, it is possible that many accidents could be avoided. One approach for building such as warning system is to ask an expert to describe as many dangerous situations as possible and formalize that information in an automated reasoned. However, the circumstances leading to a crash are frequently subtle and may vary for different drivers. Moreover, it may not be possible to predict a crash from a static snapshot of the road; the recent history of the car and other object on the road may have to be taken into account as well. It is difficult to know how long such a history should be or what objects it should track. Yet if the car could learn on its own what to track and how long to keep salient events in memory, these challenges could be overcome. In addition, cars could be trained with different drivers under different circumstances, creating more flexible warning system. A road speed limit is the maximum speed allowed by law for road vehicles. Speed limits are commonly set and enforced by the legislative bodies of nations or provincial governments, such as countries within the world. Due to the ever-increasing traffic demand, modern societies with well-planned road management systems, and sufficient infrastructures for transportation still face the problem of traffic congestion. This results in loss of travel time, and huge societal and economic costs.

Traffic Sign Recognition (TSR) is used to regulate traffic signs, warn a driver, and command or prohibit certain actions. A fast real-time and robust automatic traffic sign detection and recognition can support and disburden the driver and significantly increase driving safety and comfort. Automatic recognition of traffic signs is also important for automated intelligent driving vehicle or driver assistance systems. This paper presents a study to recognize traffic sign patterns using RFID. The most important goal of the traffic engineering today is improving of the traffic systems safety and increasing of their efficiency. One possible approach is to make the vehicles more intelligent.

Different places or zones has different speed limits at the curvature, at the city junctions, at the double roads, near the hospitals and schools etc, the speed limit varies according to the area and the road condition and the density of the road traffic. The automatic speed governing system has to adjust and sense the related speed specified and to monitor the automobile speed accordingly automatically. The sign board also specifying the school zone where horn is prohibited and at curvature automatic horn is required. Intelligent Speed Adaptation of a standard speed limiter is a system that restricts the speed of the vehicle when the driver tries to exceed the maximum allowed driving speed. When the speed limiter is incorporated with the intelligence to adjust the maximum driving speed to the speed limit specified by the roadside infrastructure or to the prevailing location-based legal speed limit, and to provide feedback to the driver when that speed limit is exceeded, then we get the technology called Intelligent Speed Adaptation.

Safe operating speeds can exceed the design speed. Example reasons include

- A design speed is not a representative speed of an entire roadway. Rather, the road's design speed is limited by its most restrictive feature, such as a curve, bottleneck, or hill.
- Actual roadway design may exceed the design specifications.
- Current parameters for determining the design speed assumes the capacity of outdated automotive technology.
- The stated design speed for a given road is usually not changed. Therefore, the design speed on older roads, which were calculated with older methodologies, may not factor in improved automotive technology which can maintain designed safety at higher travel speeds.

The field to which this invention relates is that of safety bumpers for vehicles such as automobiles. More specifically, it relates to bumpers which incorporate inflatable elements which themselves tend to absorb the shock of a collision and prevent it from being transmitted to the vehicle. We have pleasure in introducing our new project “pre-crash smart vehicle with pneumatic bumper”, which is fully equipped by IR sensors circuit, pneumatic bumper circuit. It is a genuine project which is fully equipped and designed for automobile vehicle. The “pre-crash smart vehicle with pneumatic bumper” can stop opposite running vehicle. This project is a fully automation project. Pneumatic bumper are designed to prepare for a crash full time although crashes are relatively rare events. Full time readiness for a crash has imposed stringent restrictions on the styling, design and utility of motor vehicles. With the advancement in sensing technologies, a new class of safety features, called crash

preparation features, has shown great potential in relieving the design restrictions. “Crash preparation” is the timely reconfiguration of a vehicle’s structure and interior to the crash-ready state before an imminent crash.

In this paper, another conceptual crash preparation feature, called extendable and retractable bumper is presented. The E/R bumper is normally in the stowed position. When a high-risk of frontal impact crash is detected, the bumper extends to provide additional crush space. Recall that in a frontal impact crash accident, the kinetic energy of a motor vehicle is rapidly converted into work by plastic deformation of vehicle structures. During this energy conversion process, the vehicle is decelerated in a relatively short time and distance. The stopping distance, which is a function of the available crush space and the crush efficiency of the front-end of a vehicle, is a good crash severity indicator. For vehicles involved in similar crash impact conditions, elementary physics ensures that those with less crush space and lower crush efficiency will have shorter stopping distances, higher average deceleration, and hence, more severe crash outcomes.

As motor vehicles have become more compact to meet the ever-stringent fuel efficiency requirements, the available crush space of motor vehicles has been involuntarily reduced. The E/R bumper is the only known safety feature that could provide the desired crush space only when a need appears. The additional crush space would allow the extended bumper structure to absorb additional crash energy to reduce the severity of the crash. The bumper automatically retracts when the risk subsides. In this paper the proof of concept of the E/R bumper and its potential benefits are discussed in detail.

We have pleasure in introducing our new project “Pre Crashing System”, which is fully equipped by IR sensors circuit and Pneumatic bumper activation circuit. It is a genuine project which is fully equipped and designed for Automobile vehicles. This forms an integral part of best quality. This product underwent strenuous test in our Automobile vehicles and it is good

Need For Automation:

Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics form an attractive medium for low cost automation. The main advantages of all pneumatic systems are economy and simplicity. Automation plays an important role in mass production.

For mass production of the product, the machining operations decide the sequence of machining. The machines designed for producing a particular product are called transfer machines. The components must be moved automatically from the bins to various machines

sequentially and the final component can be placed separately for packaging. Materials can also be repeatedly transferred from the moving conveyors to the work place and vice versa.

Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. The manufacturing operation is being atomized for the following reasons.

- To achieve mass production.
- To reduce man power.
- To increase the efficiency of the plant.
- To reduce the work load.
- To reduce the production cost.
- To reduce the production time.
- To reduce the material handling.
- To reduce the fatigue of workers.
- To achieve good product quality.
- Less Maintenance.

1.2 RFID Concept

Radio Frequency Identification (RFID) Technology shows a continuous growth in various application fields, like logistics, medical science, security, access control etc. The RFID system is a three component system consisting of: tag, reader and database. The access control, specifically, is detection of IDs entry to or exit from the range area of the RFID reader. Transponders (Tags) must have the circuitry needed to harvest power from the electromagnetic fields generated by the interrogator, the necessary memory elements, as well as the different control circuits.

The Fig. 1.2.1 shown below is how an active RFID tag communicates with the reader. In our discussion we consider active tags only.

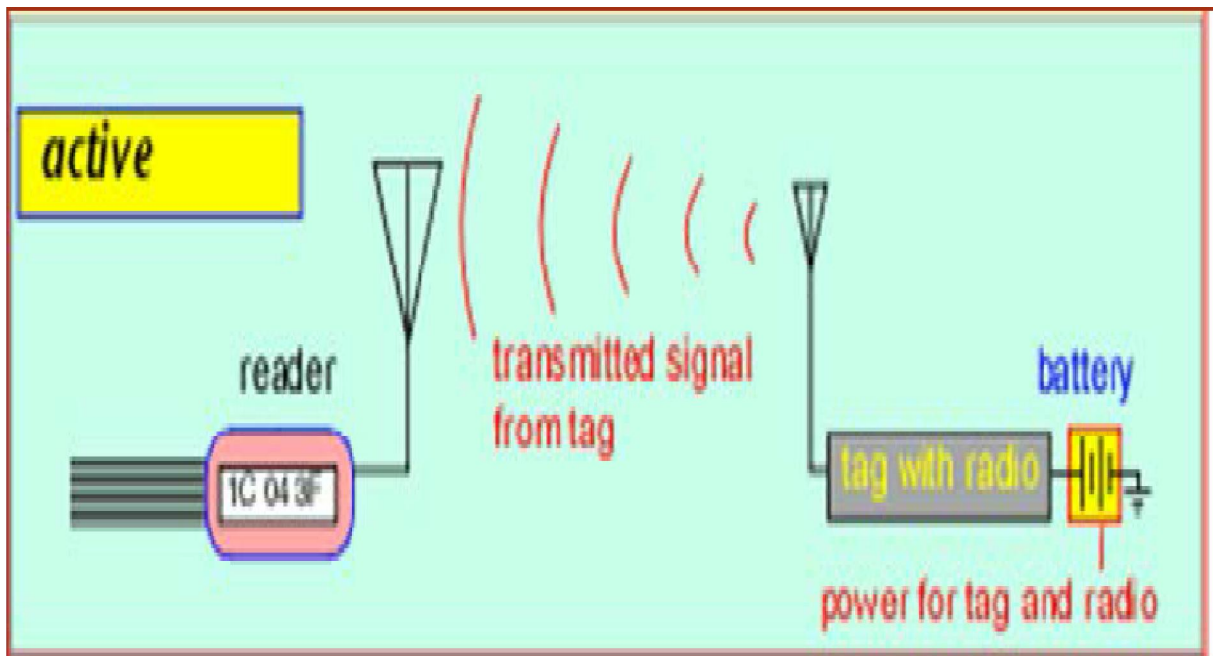


Fig. 1.2.1 Working of active RFID tag.

The vehicle's control changes the speed setting of the vehicle upon the first detection of the RFID tag associated with a given traffic signal according to the information conveyed by it, then maintains the target velocity until detection of the next signal. For the case where traffic signals are placed too close tag detections might be produced almost immediately.