# A VIDEO-ANALYSIS-BASED LEVEL CROSSING USING MICROCONTROLLER

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**Abstract**—*Safety and security are the most discussed topics in the road and railway transportation field. Latest security initiatives in the field of railway transportation propose to implement video surveillance at level crossing(LC)environments. In this paper we explore the possibility of implementing a smart video surveillance security system that is tuned toward detecting and evaluating abnormal situations induced by users(pedestrians, vehicle drivers, and un attended objects)in LCs .In this paper, we propose a real-time embedded train recognition system for authentication for vehicle. The system is implemented on embedded platform and equipped with novel train recognition algorithm. Here using webcam, video is captured .In the pc section we have database were the authentication the matching will done .after that using RS232 module to transmitted authentication details. In the receiver section, to collect the transmitted details and given to PIC .The control unit is called PIC. After that identified until provided information to the buzzer and alert led's.*

**Keywords— Degree of danger,level crossing(LC),Background subtraction,tracking,video surveillance.**

## 1. INTRODUCTION

Considered as a weak point in road and railway infrastructure, improving level crossings (LCs) safety became an important field of academic research and took increasing railway undertaking concerns. Improving the safety of people and road–rail facilities is an essential key element to ensuring good operation of the road and railway transport. Statistically, nearly 44% of LC users have a negative perception of the environment, which consequently increases the risk of accidents for example, several dramatic accidents have occurred in recent years, involving buses with children onboard.

Always, in France, when an accident occurs, the transport operator waits for a road user noticing the accident to use a very old telephone installed at the LC premises to warn the traffic center that something bad is happening at the LC. Then, the operator at the traffic center calls all the approaching trains to tell them to stop immediately without any additional information on what is going on. In the meantime, at the LC level, the situation is becoming worse, because of the wounded users and/or the blocked traffic. This is a "blind" way of managing LC incidents.



Fig1.General presentation of the architecture.

## 2. RELATED WORK

Safer European Level Crossing Appraisal and Technology Rail transportation is undoubtedly one of the safest modes of transport, although the interface between road and rail, named LC, represents a big potentiality of accidents for the railways. LC is considered a particular weak point in road and railway infrastructure, and then, a high level of safety requirements constitutes a significant concern for rail companies and road organizations. Road and railway safety stake holders plan to explore new technologies to reduce LC accidents because of the number of horrible fatal accidents that road vehicle drivers cause. In recent years, several projects were planned to upgrade LC safety systems. The "Safer European Level CrossingAppraisalandTechnology"(SELCAT)projecthasproposedacommonLCaccidentinformation system for evaluation of possible technological LC safety solutions and for reporting all LC accidents in European countries. In Japan, an "intelligent transport system"(ITS)was designed to improve the safety of transportation systems. Nevertheless, developing a new LC safety system that allows to quantify the risktobereducedisstillthemainfocusfortechnicalsolutions.Inthisproject,one of the objectives is to perform a video-analysis-based system to recognize hazard situations and evaluate the degree of danger of each detected and tracked moving object at LC.

Serial Communication

Serial communication is basically the transmission or reception of data one bit at a time. Today's computers generally address data in bytes or some multiple thereof. A byte contains 8 bits. A bit is basically either a logical 1 or zero. Every character on this page is actually expressed internally as one byte. The serial port is used to convert each byte to a stream of ones and zeroes as well as to
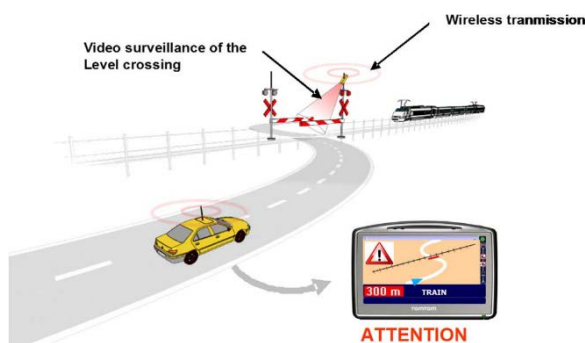
convert a stream of ones and zeroes to bytes. The serial port contains a electronic chip called a Universal Asynchronous Receiver/Transmitter (UART) that actually does the conversion. The serial port has many pins. We will discuss the transmit and receive pin first. Electrically speaking, whenever the serial port sends a logical one (1) a negative voltage is effected on the transmit pin. Whenever the serial port sends a logical zero (0) a positive voltage is affected. When no data is being sent, the serial port's transmit pin's voltage is negative (1) and is said to be in a MARK state. Note that the serial port can also be forced to keep the transmit pin at a positive voltage (0) and is said to be the SPACEor BREAK state. (The terms MARK and SPACE are also used to simply denote a negative voltage (1) or a positive voltage (0) at the transmit pin respectively).

Automatic Railway gate control system

This project work aims at the design, development and testing of working model entitled Automatic Railway Gate Controller. This paper is to provide an automatic railway gate at a level crossing replacing the gates operated by the gatekeeper. It is basically related to Radio communication and signaling system. The points or places where the Railway track crosses the road are called level crossings. Level crossings cannot be used simultaneously both by road traffic and trains, as this result in accidents leading to loss of precious lives. This type of gates can be employed in an unmanned level crossing where the chances of accidents are higher and reliable operation is required. Since, the operation is automatic; error due to manual operation is prevented. The model of railway track controller is designed by using Atmel 89S52 microcontroller, IR sensors and LDR to avoid railway accidents. By employing the automatic railway gate control at the level crossing the arrival of the train is detected by the sensor placed near to the gate. Hence, the time for which it is closed is less compared to the manually operated gates and also reduces the human labour. Automatic railway gate control is highly economical microcontroller based arrangement, designed for use in almost all the unmanned level crossings in the country.

## 3. EXISTING SYSTEM

This intelligent security system starts by detecting, separating, and tracking moving objects shot in the LC. Then, a hidden Mark model is developed to estimate ideal trajectories, allowing the detected targets to discard dangerous situations. After that, the level of risk of each target is instantly estimated by using the Dumpster Shafer data fusion technique. Theproposedanalysisallowsforalsorecognizinghazardscenarios.Thevideosurveillance system is connected to a communication system(the Wireless Access for Vehicular Environment),which takes the information on the dynamic status of the LC(safer presence of a dangerous situation)and sends it to users approaching the LC. Four hazard scenarios are tested and evaluated with different real video image sequences: presence of the obstacle in the LC, presence of the stopped vehicles line, vehicle zigzagging between two closed half barriers, and pedestrian crossing the LC area. In the existing system

video analysis is only done and there is no information transferring to vehicle.

DISADVANTAGES
Human monitoring.
No updates automatically done to driver.
Not reliable.

## 4. METHODOLOGY:PROPOSED SYSTEM

In proposed system when the train is arrive in level crossing then by the video analysis the microcontroller transforms the information to the receiver which is in vehicle. This information will effectively alert the driver. The LCD system is also displayed for trains. In this system the communication between vehicle and driver is reliable. The wireless communication is used for transferring information. The alert is also given at level crossing by the buzzer.

ADVANTAGES
Microcontroller monitoring.
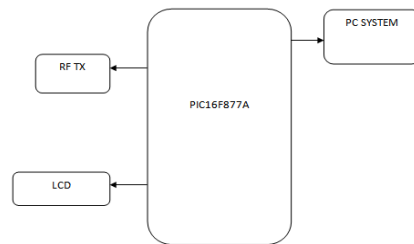Automatic update to drivers.
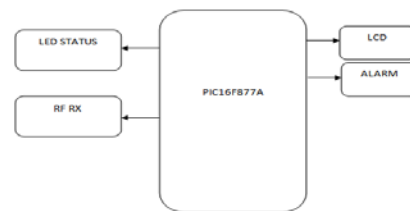Reliable and robust system.



*Fig 2.a) Transmitter*



*Fig 2.b) Receiver*

Architecture Design
Modules Description
List of Modules
　　　PIC16F877
　　　Buzzer
　　　RF Pairs
　　　2X16 LCD

*PIC16F877*

InPIC16F877 chip is available in different types of packages. According to the type of applications and usage, these packages are differentiated. One of the most important feature of the microcontroller is a number of

input/output pins used for connection with peripherals. In this case, there are in total of thirty-five general purpose I/O pins available, which is quite enough for the most applications.

## BUZZER

A buzzer or beeper is an audioalertingsignaling device, which may be mechanical, electromechanical, or piezoelectric.The most fashioned uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.Alarm unit in an operation and maintenance (O&M) monitoring system informs the bad working state of (a particular part of) the product under monitoring.

## RF Pairs

Economical wireless transmitter and receiver solution with ASK RF Modules. It is able to transmit data wirelessly about 100 meters with the help of proper antenna design. Two versions of this devices are available with various frequencies 315MHz and 434MHz. Transmitter is able to work in a wide voltage range, 3 – 12V making it compatible for battery powered applications. Receiver works in 5V making it adaptable to interface with microcontrollers.

## 2X16 LCD

A liquid crystal display (LCD) is an electro-optical amplitude modulator known as a thin, flat display peripheral composed of any number of color or monochrome pixels sequenced in front of a light source or reflector. It is mostly used in battery-powered electronic devices because it uses very low amounts of electric power Each dot of an LCD typically made of a layer of molecules structured between transparent electrodes, and two polarizing filters, the axes of exchange of which are (in many of the cases) perpendicular to one other. With no liquid crystal between the polarizing filters, light passing through the first layer would be prevented by the second (crossed) polarizer.

## 5. RESULT:

Inthispaper,fourtypicalLCaccidentscenarios(presenceof obstacles, zigzagging betweenthebarriers,stoppedcarsline, andfallofapedestrian) acquiredinrealconditionshavebeen experimentally evaluatedbyapplyingtheproposeddangerous situationrecognitionsystem.Ariskindexhasbeendefined toassesstheriskofobjectsdetectedinLCenvironment. The methodstartsbydetectingandtrackingobjectsseeninthemon-itoredzonebyavideocamera. Thus the accident in the level crossing is detected and the alert is also given at level crossing.

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