

Modelling of Smart Mass Rapid Transport (MRT) Empty Seat Locator

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Abstract

The project presents a seat locator based on availability of seats in Mass rapid transportations. Nowadays, most people use public vehicle instead of personal car due to the rising of gasoline prices and traffic jams. Public company has been developing the system for displaying the position of the passenger vehicle for convenience of customers. However, those systems only indicate the position of the vehicle but not show the availability of seats in the vehicle. Customers will waste time waiting for the next passenger vehicle and cannot manage the time for travel or activities correctly. If customers know both of the position of the passenger vehicle and vacancy of seats, they can use the time to other activities before the passenger vehicle arrives and plan their travel better.

Keyword- Microcontroller, MAX232, IoT

I. INTRODUCTION

Nowadays, most people use public vehicle instead of personal car due to the rising of gasoline prices and traffic jams. Public company has been developing the system for displaying the position of the passenger vehicle for convenience of customers. However, those systems only indicate the position of the vehicle but not show the availability of seats in the vehicle. Customers will waste a time for waiting the next passenger vehicle and cannot manage the time travel or activities correctly. If customers know both of the position of the passenger vehicle and vacancy of seats, customers can use the time to other activities before the passenger vehicle arrives. Customers can plan their travel better. In this research, the seat vacancy identification system is designed by using image processing technique. Camera is connected to a processing unit in the vehicle for detecting the object on vehicle and sending data to IoT Module. The data is transferred to cloud storage. The data from cloud storage is interfaced with web domain and information is made accessible to the user. This system use Open Source Computer Vision (OpenCV) to analyze and process the data then calculated the vacancy of the electric vehicle by using the maximum face detection data.

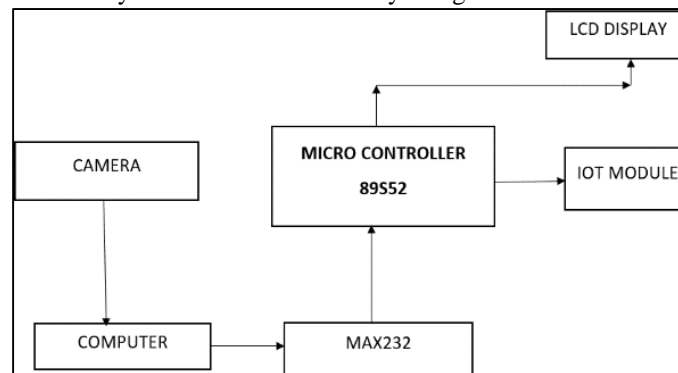


Fig. 1: Block Diagram of Smart MRT Empty Seat Locator

II. WORKING PRINCIPLE AND EXPLANATIONS

A. Methodology

The Development of the system starts with the design architecture of the proposed system. The Block Diagram of the system is shown in Fig.1.

The First Part of the project is the Sensor, which here is the Camera. It is connected to the Micro Controller through a Computer process the image. The computer is having an Intel core i5 processor, 4GB RAM and 2GB Graphics installed with MATLAB.

Then the circuit is combined with the Micro- Controller through a MAX232 integrated circuit. It converts signals from a TIA-232 serial (9 pin) port to a signal suitable for use in TTL- compatible digital logic circuit. The MAX232 is a Dual Transmitter/Receiver that typically is used to convert TX, CTS, RX, RTS signals.

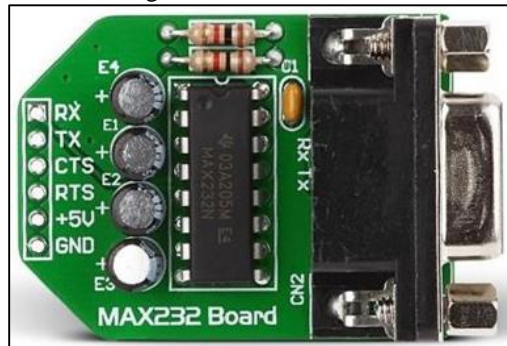


Fig. 2: MAX232 Board

The MAX232 link the Data to the Microcontroller AT85S92, which is a high- performance low power CMOS 8-bit microcontroller with 8KB ISP flash memory. The device use Microchip high-density, non- volatile memory technology and is compatible with the industry standard 80C51 instruction set.

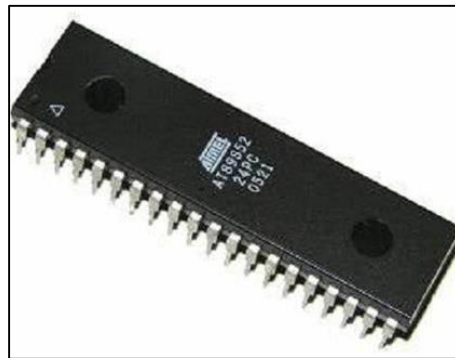


Fig. 3: Microcontroller 85S92

The data's are sent to cloud through IoT module and can be accessed by a user with an internet access. The data's are displayed parallel in an LCD display connected outside the MRT.

III. RESULT AND DISCUSSION

A prototype of automatic trolley system is developed. The design of the whole project was done with Microcontroller 85S92, Camera, Computer, MAX232, IoT Module, LCD Display. All the wiring and connections are connected to the AT85S92 and Computer. The Circuit is programmed using MATLAB.

The Camera Capture the images in intervals, it is been detected by the MATLAB and processed. The MATLAB incorporates it with the Microcontroller with the help of MAX232. The AT85S92 finds the vacant seats present in the MRT and is sent to the Cloud through IoT Module and Display in the LCD display Connected outside the MRT.

A MRT user can access the cloud data using internet and can also know the vacancy by utilizing the LCD display.

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