

SENSOR BASED CAR PARKING INDICATION AND ALERTING SYSTEM

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ABSTRACT

The main aim that we have is to create a completely automated car parking system with minimal human interference. With the rising population in the world, time is of the essence and hence we need to minimize the time taken by trivial activities such as finding a place to park in a busy place and avoid traffic congestion. We have seen in existing systems sometimes accidents can occur in parking situations by cars going at high speed o caused by frustrated drivers unable to find a parking space for a long period of time. In our project we propose a smart and automated car parking model that will help the user in booking their parking spaces beforehand and the vehicle will be able to park automatically once in the parking zone .The difference between our project of automated car parking systems is we hope to minimize human interaction as much as possible and make both the vehicle and the parking area fitted with sensors that will help us execute a safe and efficient way of parking. Hence, we aim to provide a completely safe and automated experience

that is robust and can be implemented in real time and hopefully be implemented as the general norm for parking systems in the future.

INTRODUCTION

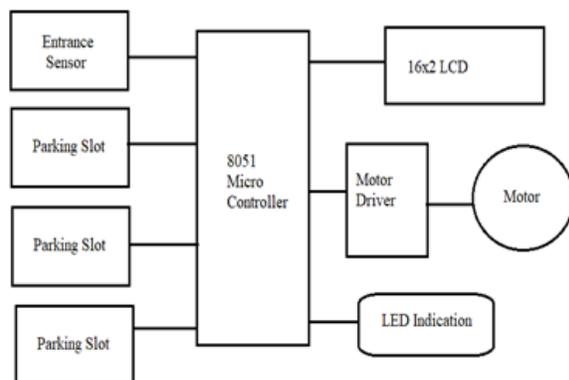
In the 21st century finding a free car parking slot has become a mind numbing process, especially for people who travel in the morning to work or following their daily routine, they find it difficult and challenging to find a parking spot for their cars. Moreover, the parking slots are never used user friendly end provide no logical data about the availability of the spot unless the user visits it manually.

In our ever populating cities and districts to find parking space is becoming increasingly difficult as traffic increases. Drivers have to go back and forth desperately looking for parking spaces wasting their valuable time, fuel consumption with increased likelihood of causing accidents.

With the help of wireless network technology we propose remote parking monitoring and automated guidance which helps to save a lot of time.

In the existing system we can see that some supervision is required for the parking system and it is not fully automated. The driver has to make sure that the car is parked in a spot without disturbing the convenience of others. In most of the cases the main problem is finding the spot and trying to secure the spot for parking which in turns leads to increased stress level for the person driving the car.

Moreover, the relative analysis of the data is structural to the implementation of the parking procedure. Nowadays, in the busy world it's really hard for a person to find a spot for parking. The current parking system doesn't give the user a specified parking slot inside the area. Barking in general in a long and time-consuming process and we hope to provide a solution to alleviate this problem.



Embedded systems have become very important today as they control many of the common devices we use. Since the

embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance.

Some embedded systems are mass-produced, benefiting from economies of scale. Physically embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants.

Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure. In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems — such as the operating systems and microprocessors which power them — but are not truly embedded systems, because they allow different applications to be load and peripherals to be connected.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device. Industrial machines,

automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system. Embedded systems that are programmable are provided with a programming interface, and embedded system programming is a specialized occupation.

HARDWARE COMPONENTS

Microcontroller (MC) may be called computer on chip since it has basic features of microprocessor with internal ROM, RAM, Parallel and serial ports within single chip. Or we can say microprocessor with memory and ports is called as microcontroller. This is widely used in washing machines, VCD player, microwave oven, robotics or in industries. 2

Microcontroller and Embedded Systems • Microcontroller can be classified on the basis of their bits processed like 8bit MC, 16bit MC. 8 bit microcontroller, means it can read, write and process 8 bit data. Example - 8051 Microcontroller. Basically 8 bit specifies the size of data bus. 8 bit microcontroller means 8 bit data can travel on the data bus or we can read, write process 8 bit data.

MC 8051 has 128 byte Random Access memory for data storage. Random access memory is nonvolatile memory. During execution for storing the data the RAM is used. RAM consists of the register banks, stack for temporary data storage. It also consists of some special function register (SFR) which are used for some specific purpose like timer, input output ports etc. Normally microcontroller has 256 byte RAM in which 128 byte is used for user space which is normally Register banks and stack. But other 128 byte RAM which consists of SFRs. We will discuss the RAM in detail in next section.

Now what is the meaning of 128 byte RAM, What are address range which is provided for data storage.

We will discuss here. We know that 128 byte = 2⁷ byte

Since 2⁷ bytes so last 7 bits can be changed so total locations are from 00H to 7F H. This procedure of calculating the memory address is called as “memory mapping”. We can save data on memory locations from 00H to 7FH. Means total 128 byte space from 00H to 7FH is provided for data storage.

SOFTWARE REQUIREMENTS

KEIL MICRO VISION IDE FOR PROGRAMMING

µVision is a window-based software development platform that combines a robust and modern editor with a project manager and make facility tool. It integrates all the tools needed to develop embedded applications including a C/C++ compiler, macro assembler, linker/locator, and a HEX file generator. µVision helps expedite the development process of embedded applications by providing the following:

Full-featured source code editor.

Device Database for configuring the development tool.

Project Manager for creating and maintaining your projects.

Integrated Make Utility functionality for assembling, compiling, and linking your embedded applications.

Dialogs for all development environment settings.

True integrated source-level and assembler-level Debugger with high-speed CPU and peripheral simulator.

Advanced GDI interface for software debugging on target hardware and for connecting to a Keil® ULINK™ Debug Adapter.

Flash programming utility for downloading the application program into Flash ROM.

Links to manuals, on-line help, device datasheets, and user guides.

The µVision IDE and Debugger is the central part of the Keil development tool chain and has numerous features that help the programmer to develop embedded applications quickly and successfully. The Keil tools are easy to use, and are guaranteed to help you achieve your design goals in a timely manner.

µVision offers a build mode for creating applications and a debug mode for debugging applications. Applications can be debugged with the integrated µVision Simulator or directly on hardware, for example ULINK Debug and Trace Adapters. Developers can also use other AGDI adapters or external third-party tools to analyse applications.

Dennis Ritchie developed the C programming language in 1969. The C programming language is structured in a collection of a single function or multiple functions. Uniquely specified tasks are performed by statements, and these statements are collectively called a function. C language is sometimes also referred to as a middle level programming language, as the language provides the developers the freedom to develop high level applications as well as low level languages.

WORKING

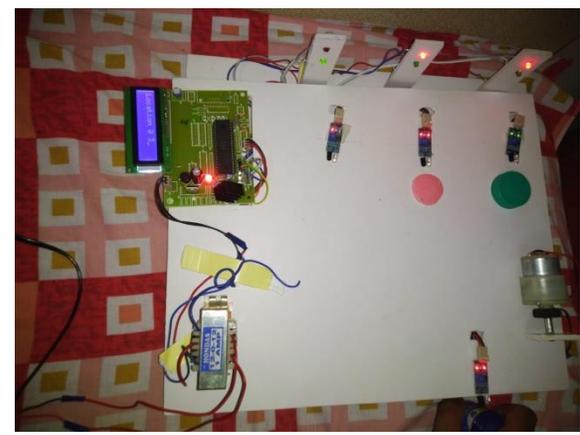
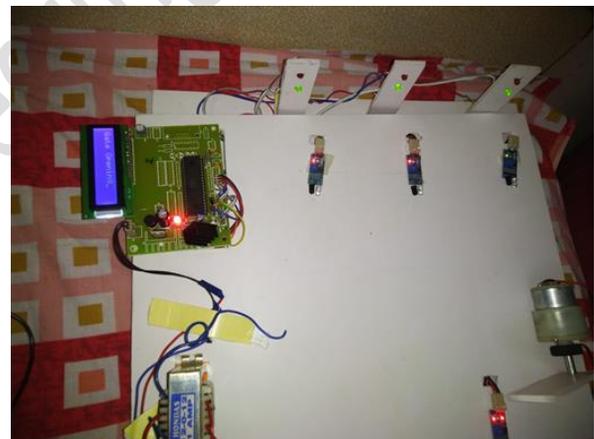
How it works column drivers take their cars to entrance of the automatic parking system where all occupants exit the vehicle. From here, the vehicle is moved by the mechanical managers to an available space where it is automatically parked by an attendant.

The proposed model provides real time information about detecting the vacant parking slot in the real time. In this project we will use infrared sensors to detect the parking lot is empty or not? We will use automatic gate at the entrance to detect the vehicle and any parking spot is empty or available then the gate will be open. It's not lots are available then the gate would open and the alarm will sound the slot status will be displayed on the LCD

We will use lead indications inside the parking area to easily identify which slot is available. Nowadays, finding a secure parking lot in modern cities deemed as very hard and time-consuming task. Leaving negative implications on the traffic congestion, air pollution, climate changes, etc. Are also creating difficult situations to find the secure parking lot on required time.

Thus, smart parking system [SPS] deemed inevitable option to solve those issues and build a comprehensive smart transportation system. The proposed model

provides real time information about detecting the vacant parking slot in real time. In this project we will use infrared sensors to detect the parking lot is empty or not we will use automatic gate at the entrance to detect the vehicle and any parking slot is empty or available then only the gate will be open. If no slots are available then gate won't open and the alarm will sound. The slots status will be displayed on the LCD. We will use a lead indications inside the parking area to easily identify which slot is available.



CONCLUSION

In this study, the various types of smart parking system and has been presented. From the various examples of the implementation of the smart parking system being presented, its efficiency in alleviating the traffic problem that arises especially in the city area where traffic congestion and the insufficient parking spaces are undeniable. It does so by directing patrons and optimizing the use of parking spaces. With the study on all the sensor technologies used in detecting vehicles, which are one of the most crucial parts of the smart parking system, the pros and cons of each sensor technologies can be analyzed. Although, there are certain disadvantages in the implementation of visual based system in vehicle detection as described earlier, the advantages far outweighs its disadvantages.

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