AUTOMATIC MOBILE PLATFORM FOR PHYSICALLY CHALLENGED PEOPLE IN RAILWAY STATION

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1. Introduction

ABSTRACT: Today the cheapest mode of transportation is railway but now no. of accident of railway are increasing due to careless railway crossing. Careless in operations and lack of knowledge of workers are main reason of this, therefore we are trying solution of this problem. This paper gives new smart railway track mainly for physically disabled and aged persons. This railway track is automatically works in railway platform. Normally two platforms are connected by mobile platforms through which passenger can walk. A disabled person is given an RFID tag, on scanning the tag on the RFID reader, a moving floor like path is layered connecting the two rail steels of the track. We placed radio frequency communication modules for achieving the process of finding train on the track. With the help of RF module we are trying automatic control of railway gates. When automatically opened and train go through track and when train leaving the area the mobile platform will automatically get closed. To sense the presence of train we are using RF module. By sensing the train on one path we are giving pulses to the motor to open or close the mobile platform. Here we have used the Atmel microcontroller ATmega8.

Key Words: DC motors, RF communication, microntroller.

2 Existing System

The existing system is partially manmade and there is no any type of indication for train arrival. The sensors are placed at the tracks which are in side. When the train reaches first sensor, the platform closed and when the second sensor senses the train departure mobile

platform is opened. The mobile platform did not move like an escalator. Due to this system the physically challenged people and handicapped persons feel difficult to cross.

3 Proposed System

The process is mainly classified into two steps i.e. train detection and path opening. The train detection determines the train position to prevent a train from being mistaken.

Collecting information from the station PC train position can be detected. We can also detect it by using an radio frequency receiver and transmitter placed along the

track. Now trains travelling on a railway line obey various safety standards but On the other hand, it also have to manage number of new challenges and are under economic pressure to improve and optimize significantly their operations in terms of track occupancy, safety, productivity and customer satisfaction.

The radio frequency receiver is connected at the track to identify the arrival of train. The system consists of data acquisition unit, processing unit and information multicasting unit. Data approaches the station in some distance, the IR sensor senses it and gives signal to PIC micro controller. The control signal form microcontroller is given to the piston. If the train leaves the station the sensor placed at the other end sense the information and piston will push the platform for usage. The voice chip present in the kit will help the passenger to guide about the arrival and departure of train.

In our project authentication key is added for security purpose and using an alarm for the intimation of an arrival and departure of train in railway junction

3.1 Advantages
- It gives a smart facility to the physically challenged people
- The voice declaration and authentication sign gives more security
- It is completely programmable
- This system is going to help for carrying the heavy loads or parcels coming via railway transportation
- In this way the risk of the people has reduced while changing the platforms

4 SOFTWARE DESCRIPTIONS
4.1 Platform-AVR STUDIO
The AVR is a modified Harvard architecture8-bitRISC single chip microcontroller which was developed by Atmel in 1996. The AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as opposed to one-time programmable ROM, EPROM, or EEPROM used by other microcontrollers at the time.

4.2 Device overview
The AVR is a modified Harvard architecture machine where program and data are stored in separate physical memory systems that appear in different address spaces, but having the ability to read data items from program memory using special instructions.

4.3 Device architecture
Flash, EEPROM, and SRAM are all integrated onto a single chip, removing the need for external memory in most applications. Some devices have a parallel external bus option to allow adding additional data memory or memory-mapped devices. Almost all devices (except the smallest Tiny AVR chips) have serial interfaces, which can be used to connect larger serial EEPROMs or flash chips.

4.4 Program memory
Program instructions are stored in non-volatile flash memory. Although the MCUs are 8-bit, each instruction takes one or two 16-bit words.

The size of the program memory is usually indicated in the naming of the device itself (e.g., the ATmega64x line has 64 kB of flash while the ATmega32x line has 32 kB).

There is no provision for off-chip program memory; all code executed by the AVR core must reside in the on-chip flash. However, this limitation does not apply to the AT94 FPSLIC AVR/FPGA chips.

4.5 EEPROM

Almost all AVR microcontrollers have internal EEPROM for semi-permanent data storage. Like flash memory, EEPROM can maintain its contents when electrical power is removed.

In most variants of the AVR architecture, this internal EEPROM memory is not mapped into the MCU's addressable memory space. It can only be accessed the same way an external peripheral device is, using special pointer registers and read/write instructions which makes EEPROM access much slower than other internal RAM.

However, some devices in the Secure AVR (AT90SC) family use a special EEPROM mapping to the data or program memory depending on the configuration. The XMEGA family also allows the EEPROM to be mapped into the data address space.

Since the number of writes to EEPROM is not unlimited — Atmel specifies 100,000 write cycles in their datasheets — a well designed EEPROM write routine should compare the contents of an EEPROM address with desired contents and only perform an actual write if contents need to be changed.

4.6 Program execution

Atmel's AVRs have a two stage, single level pipeline design. This means the next machine instruction is fetched as the current one is executing. Most instructions take just one or two clock cycles, making AVRs relatively fast among the eight-bit microcontrollers.

The AVR families of processors were designed with the efficient execution of compiled C code in mind and has several built-in pointers for the task.

4.7 MCU Speed

The AVR line can normally support clock speeds from 0-20 MHz, with some devices reaching 32 MHz Lower powered operation usually requires a reduced clock speed. All recent (Tiny, Mega, and X mega, but not 90S) AVRs feature an on-chip oscillator, removing the need for external clocks or resonator circuitry. Some AVRs also have a system clock prescaler that can divide down the system clock by up to 1024. This prescaler can be reconfigured by software during run-time, allowing the clock speed to be optimized.

Since all operations (excluding literals) on registers R0 - R31 are single cycle, the AVR can achieve up to 1 MIPS per MHz, i.e. an 8 MHz processor can achieve up to 8 MIPS. Loads and stores to/from memory take 2 cycles, branching takes 2 cycles. Branches in the latest "3-byte PC" parts such as ATmega2560 are one cycle slower than on previous devices.

4.8 Development

AVRs have a large following due to the free and inexpensive development tools available, including reasonably priced development boards and free development software. The AVRs are sold under various names that share the same basic core but with different peripheral and memory combinations. Compatibility between chips in each family is fairly good, although I/O controller features may vary

4.9 Programming interfaces

There are many means to load program code into an AVR chip. The method to program AVR chips varies from AVR family to family.

4.10 AVRDUDE AVR Programmer

USBasp - USB programmer for Atmel AVR controllers

USBasp is a USB in-circuit

programmer for Atmel AVR controllers. It simply consists of an ATMega8 and a couple of passive components. The programmer uses a firmware-only USB driver

4.11Features

- ➢ Flash Burner for AVR Series from ATMEL
- ➢ Communication - USB
- ➢ Auto Erase before writing and Auto Verify after writing
- ➢ Freeware AVR GCC C Compiler
- ➢ ISP Programming FRC Socket
- ➢ Connects through AVR DUDE

5 Conclusions

The aim of this paper was to develop a project that could help the physically handicapped and aged persons to cross the railway platform in easy manner. Thus the tracking of train is sensed continuously, which automatically close/open the mobile platform is partially automated which is beneficial for passengers to cross the rail grade crossing.