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ANDROID DRIVEN SMART CAR

Archit Saxena[1], Kumar Manu[2], Anant Shaurya Gaur[1], Abhilash Rastogi[1], Abhishek Tiwari[1]
B.Tech Final Year Students [1], Assistant Professor[2]
Department of Electronics & Communication Engineering,
Moradabad Institute of Technology, Moradabad, Uttar Pradesh, India

ABSTRACT

For the past hundred years, innovation within the automotive sector has brought major technological advances, leading to safer, cleaner, and more affordable vehicles. But for the most part, since Henry Ford introduced the moving assembly line, the changes have been incremental, evolutionary. Now, in the early decades of the 21st century, the industry appears to be on the cusp of revolutionary change—with potential to dramatically reshape not just the competitive landscape but also the way we interact with vehicles and, indeed, the future design of our roads and cities. The revolution, when it comes, will be engendered by the advent of autonomous or "self-driving" vehicles. And the timing may be sooner than you think.

INDEX TERMS- *pieDrive, Input-Output Concept, Logic*

I. INTRODUCTION

In the current scenario, the number of advanced driver assistance systems is constantly increasing. pieDrive is also a driver assistance system which is based on the idea of separated input and output. Therefore, the driver enters his input on a touch pad which is placed on the right armrest of his seat and the car performs the particular action that the driver wants it to do.

This limitation of having a touch pad on the armrest inspired us to use our smart phone as the input device, as smart phone is very common and easy to use. Moreover, it provides flexibility to the user. Our prototype of pieDrive uses an android phone application installed on the smart phone. In this paper, we focus our attention to control the car with our android phone.

II. BLOCK DIAGRAM

As can be seen in the block diagram, the input from the user is given through the touch panel. This data from the user will be in analog form. For further processing, we need digital data. Hence, we use analog-to-digital converter (ADC) for the conversion of this analog data to digital data. Now for the purpose of transmitting this digital stream of data, we have Bluetooth which is inbuilt in our mart phone. The frequency used for the

transmission and reception purpose is 2.4 GHz.

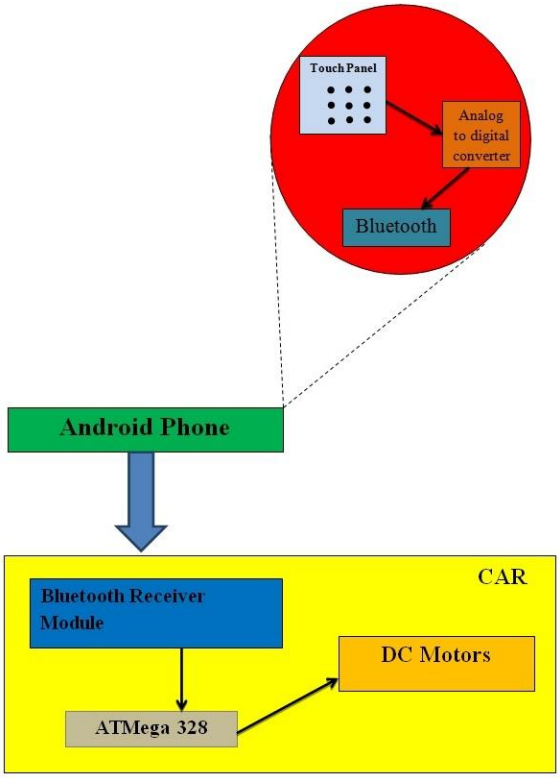

Figure 1: Block Diagram

Now, this transmitted bit stream is received by the Bluetooth module installed in our car. This bit stream is then forwarded to the ATMega 328p microcontroller having 28 pins. This is an 8 bit microcontroller which means it can process 8 bits simultaneously. This microcontroller handles all the logic for the respective direction and distance. The bit stream received by the Bluetooth receiver is processed according to the program in the microcontroller, which is already fed in the microcontroller. According to this program, DC motor is controlled. The DC motor is then connected to the wheels which drives the whole model.

III. ANDROID APPLICATION

Android phones are very common these days. Therefore, it would be a great idea if we can use android smart phones as input device. That is exactly what we have done in our project. We have made our own android application named 'pieDrive'.

We took the help of MIT App Inventor for making our application. App Inventor for Android is an open-source web application originally provided by Google, and now maintained by the Massachusetts Institute of Technology (MIT). App Inventor has a user friendly layout which serves as an interactive platform for even the novices to easily develop an app just by understanding simple logic of blocks.

We have 4 different options to control the car, which are accelerometer, switch control, voice recognition and touch panel.

A. Home Screen

Figure 2 shows the home screen of our application. We can see that there are four different options. Here, the image pieDrive is the bluetooth connectivity pannel which specifically, starts looking for the available paired devices and is also

Figure 2: Home Screen

the way to get started.The text box written as 'Status' tells the status of the connected device and its address.

B. Accelerometer

Figure 3 shows the screen for accelerometer. The android device when titlted in a direction, the car also moves in the same direction. This works on the same logic as the G-sensor controlled games.

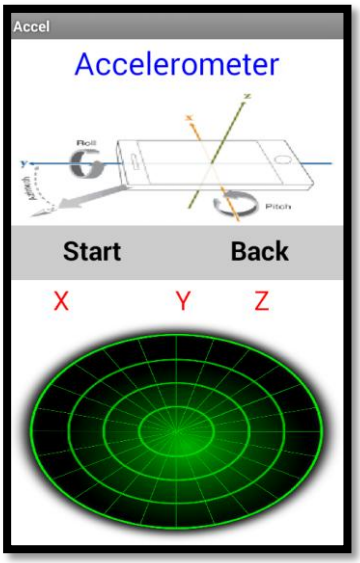

Figure 3: Accelerometer

C. Switch Control

Figure 4 shows the screen for the switch control. This method utilises the localised touching concept and is used to control the car for moving in specific directions. Firstly, the user needs to press the start button. Then, the initialisation process takes place. The car will then move in the respective direction as the user wants according to the button pressed.

Figure 4: Switch Control

D. Voice Recognition

Figure 5 shows the screen for voice recognition. VoIP is used to control the car. The basic requirement to use this feature is internet. Without the internet, this feature will be of no use. Due to this, it may look like this is the least used option. But, this is not the case. Once connected to internet, it is the most user interactive option of our android application.

Figure 5: Voice Recognition

E. Touch Panel

Figure 6 shows the screen for touch panel. The user draws the pattern on this touch panel on the 6x6 matrix. Each point on the matrix has its own coordinates which will be used for transmission. The transmission starts once the user presses the start button.

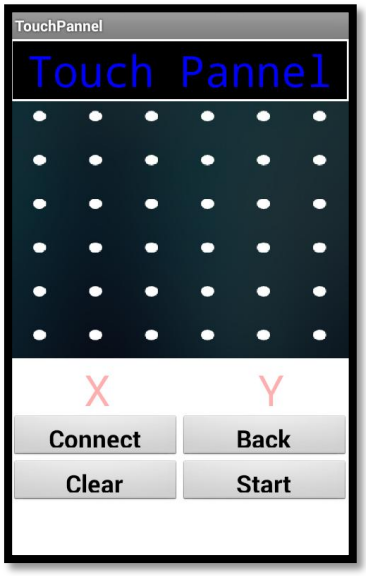

Figure 6: Touch Panel

IV. APPLICATIONS

For physically challenged person using wheel chair, our project serves an aid. The person just needs to give the commands using an android phone.

Having some advancement in our current project, we can serve for the MSW management. An unmanned vehicle can collect the solid waste from the dustbins placed at certain specified distance from each other.

It can also be used in the war field for the transportation of the ammo from one place to another. Moreover, it can also be remotely controlled to lock and then fire the target.

V. CONCLUSION

The prototype is developed to show how possibly the pieDrive can be implemented and thus be made to reach each and every car of the world. The prototype developed, has in a way added to the qualities of pieDrive, the pieDrive technology doesn't actually include any Android application to develop the car, but the prototype developed has added this feature too. This feature makes it better as android phones are very common these days and also easy to use.

Thus, for now it can be said that it is the most adaptive, user friendly, interactive and advanced driving assistive

system to be installed in cars just to make them automated.

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AUTHORS' BIOGRAPHY

Archit Saxena is pursuing B.Tech in Electronics & Communication Engineering from Moradabad Institute of Technology, Moradabad. Area of interest includes Telecommunications.

Kumar Manu is currently working as Assistant Professor in Department of E&C Engineering at Moradabad Institute of Technology, Moradabad, India. He completed his B.Tech. from UP Technical University, Lucknow, India in year 2006 and M.Tech. from Motilal Nehru National Institute of Technology, Allahabad, India in year 2012. His current research areas are Observers, Neural Networks, Renewable Energy and Embedded Systems.

Anant Shaurya Gaur is pursuing B.Tech in Electronics & Communication Engineering from Moradabad Institute of Technology, Moradabad. Area of interest includes Telecommunications.

Abhilash Rastogi is pursuing B.Tech in Electronics & Communication Engineering from Moradabad Institute of Technology, Moradabad. Area of interest includes Telecommunications.

Abhishek Tiwari is pursuing B.Tech in Electronics & Communication Engineering from Moradabad Institute of Technology, Moradabad. Area of interest includes Telecommunications.