

ARM BASED DESIGN OF DASHBOARD USING TOUCH SCREEN

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ABSTRACT

ARM BASED DESIGN OF DASHBOARD USING TOUCH SCREEN is advanced technology in automobile industries. Nowadays this replaces the electrical switches used to automate the vehicles. This is having digitized buttons on the screen to automate the peripherals of the vehicle and it also shows the status of the peripherals, whether it's ON or Not on the screen. This can control all the peripherals like Head lamps, Rear lamps, wiper, Door locks, etc. The aim is to overcome the drawbacks of Voice Command Technology which was implemented in Mahindra Xylo E9 Model. ARM based designs have seen an immense growth during the past few years, with free and open software tools becoming an integral part of embedded systems development. System-on-chip solutions based on ARM embedded processors address many different market segments including enterprise applications, automotive systems, home networking and wireless technologies. Nowadays technology enters in any field. Touch screen based dash board is an advanced technology which can be used to Control the vehicle functions like switching ON and OFF of Right indicators, Left indicators, Head lights, Opening and closing of Doors, Dipper and Dimmer, Music. In automotive field as technology is rapidly growing, on the Single screen can control the complete vehicle function and it also give modern look to vehicle. In future this technology replaces the existing peripheral devices.

KEYWORDS: Arm Contoller, Sloss, Symes, Wright, Electrical Switches Used to Automate the Vehicles

INTRODUCTION

ARM based designs have seen an immense growth during the past few years, with free and open software tools becoming an integral part of embedded systems development. System-on-chip solutions based on ARM embedded processors address many different market segments including enterprise applications, automotive systems, home networking and wireless technologies. The ARM Cortex family of processors provides a standard architecture to address the broad performance spectrum required by these diverse technologies.

Features of Project

- Completely based on touch screen.
- Low power consumption.
- User friendly.
- More reliable.

- With a single touch we can control all the hardware parts of the car.

Hardware Requirements

- 3.2" TFT Touch Screen.
- LPC1768 Cortex M3 Microcontroller.
- Adapter.
- Transformer.
- 4 channel Relay Board.
- DC Motors for Fan and Door lock.
- Pre-recorded Music board with speaker.
- LED lights for indicators and head lamps.

LITERATURE SURVEY

www.mahindra.com / **mahindra xylo E9** Automotive electronics made tremendous change in Automobile Industry. Cars are increasingly featuring built-in multimedia displays, which manufacturers say are popular with consumers. Advanced new technology complements the cabin without stealing the spotlight from all the fancy luxury. The aim is to overcome the drawbacks of Voice Command Technology which was implemented in Mahindra Xylo E9 Model.

A **voice command device** (VCD) is a device controlled by means of the human voice. By removing the need to use buttons, dials and switches, consumers can easily operate appliances with their hands full or while doing other tasks. Some of the first examples of VCDs can be found in home appliances with washing machines that allow consumers to operate washing controls through vocal commands and mobile phones with voice-activated dialling.

The Stylish New Xylo, an MUV, launched in early 2012. The Stylish New Xylo E9 model comes with Voice Command Technology - a unique technology that allows the driver to talk to the Xylo and control certain vehicle functions through voice command. The task was to evangelize this Voice Command Technology feature to build interest in the E9 model and boost pride of ownership.

Disadvantages

Sometimes users encounter the denial to access account that is really their own this is known as “false negative” but this problem is very rare and has less than 3% of possibility. If a user registered with a certain model of mobile or phone, attempted to verify his identity with a different model, faces troubles in authentication. Development of an adaptation algorithm is going on that will adapt the voiceprint to various handsets automatically, hence will increase the quality of verification even more.

To use speech recognition system you have to speak loudly than your normal voice it may have the possibility of vocal cord injury but there is no scientific proof has been presented between the voice recognition and damage to the vocal cord.

Third limitation is that when we speak right before waking up from sleep, we sound a bit different the voice changed more if last night we screamed a lot due to any occasion it confuses the SR system. If occasionally you have a trouble understanding what is said, it is obvious that a computer will have trouble much more often than us.

Inaccuracy and Slowness

Most people cannot type as fast as they speak. In theory, this should make voice recognition software faster than typing for entering text on a computer. However, this may not always be the case because of the proofreading and correction required after dictating a document to the computer. Although voice recognition software may interpret your spoken words correctly the majority of the time, you might still need to make corrections to punctuation. Additionally, the software may not recognize words such as brand names or uncommon surnames until you add them to the program's library of words.

Vocal Strain

Using voice recognition software, you may find yourself speaking more loudly than in normal conversation. In 2000, Linda L. Grubbs of PC World magazine reported that this habit could lead to vocal cord injury. Although there is no definite scientific link established between the use of voice recognition software and damage to the voice, talking loudly for extended periods always carries the possibility of causing strain and hoarseness.

Environmental Factors

The ideal environment for any voice recognition program is a quiet one, especially if you do not own a microphone that filters out ambient noise. In a loud environment, voice recognition software may fail to recognize your voice, and may even try to generate text from voices heard in the background. On the other hand, you can type with a keyboard in any environment.

Interpretation of Unusual Voices

The user has to "train" voice recognition software after installing it. The training process involves reading several passages aloud. The software compares your voice to known regional dialects and automatically adjusts for your particular accent.

RESEARCH ELABORATIONS

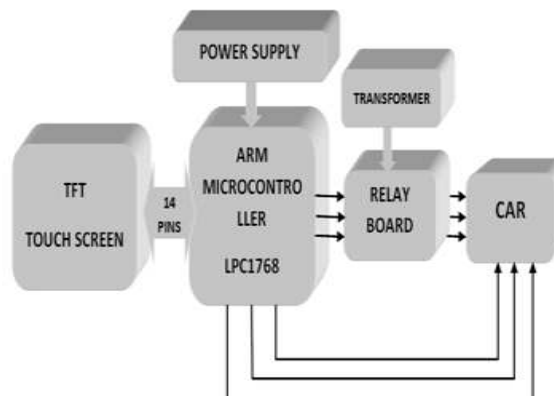


Figure 1: Block Diagram of ARM Based Design of Dashboard Using Touch Screen

TFT Touch Screen

3.2" TFT Board which comes with 320x240 pixel 3.2" color display and resistive touch screen on it. The interface is SPI for display as well as touch screen control, which converts the analog touch position data to digital (SPI) which is easier to interface with MCU. The chip outputs the active low interrupt when touch is sensed and the touch position data can be read using SPI lines by MCU.

ARM Controller LPC1768

LPC1768H is a Header Board designed for CORTEX M3 Based LPC1768 controller from NXP. The Board is a basic IO Pin out with options of onboard power and USB Device. The IO pins are taken out on 2.54 mm berg connector. The board has standard 20 PIN JTAG Connectivity for debug/programming. The Board also has reset and ISP switches for in system programming. UART 0 can be used for ISP Programming.

Relay Board

Relay board consists of 4 relays on a single board which is used to drive the 4 peripheral devices at a time. The output of each relay is given to the separate peripheral devices in a car. Relay type used is SPDT (Single Pole Double Throw) with NO, C, NC configuration.

Transformer

It is step down transformer of rating 230V AC to 12V AC. The output of transformer is connected to the relay board for its operation.

Power Supply

Adapter is used to give the proper power supply to the ARM board. Adapter is having an inbuilt micro transformer, rectifier, IC and capacitor to produce a required voltage of 7.5V DC to the ARM board.

Car

Car is a module where the all applications are placed at different parts of the car.

RESULTS



Figure 2: Overview of ARM Based Design of Dashboard Using Touch Screen

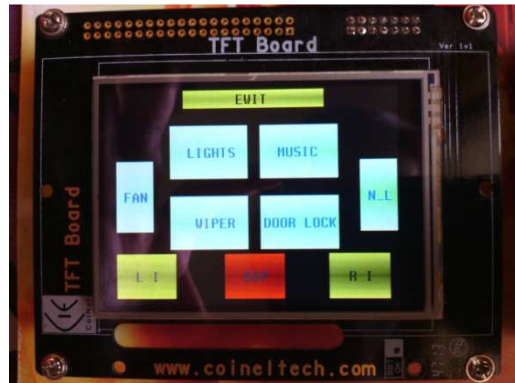


Figure 3: TFT Touch Screen with Digitized Buttons

CONCLUSIONS

Conclusion and Future Enhancement

Now days technology enters in any field .Touch screen based dash board is an advanced technology which can be used to Control the vehicle functions like switching on and off of Right indicators, Left indicators, Head lights, Opening and closing of Doors and glasses, Dipper and Dimmer, Music. In automotive field as technology is rapidly growing, on the Single screen we can control the complete vehicle function and it also give modern look to vehicle. In future this technology replaces the existing peripheral devices.

The tips and tricks which these displays will show you are only useful if you are willing to learn from your car how you can adjust driving habits to become a smart and ultimately safer drive.

Future Enhancement

- Internet browser to access the net on the screen.
- Opening and closing of the roof.
- To lock the screen we can use security pattern.
- To control the wiper.
- Temperature control.
- Opening and closing of door glasses.
- We can add GPS navigation tab for finding the places using Google map.
- We can see the back side view on the screen with the help of back camera.

On single screen we can see and operate all the above things.

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