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GESTURE CONTROLLED TOUCH SCREEN BASED AUTOMATION SYSTEM

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ABSTRACT

In the proposed paper, graphical programming is used to create an automation gadget the use of a resistive touchscreen, basically a handy far off to control the electric and digital home equipment of the viewed over condo and office. A fundamental comparison algorithm is used to attain the same. By ability of serial communication, the above stated science is carried out and Labview provides the GUI.
Keywords: Resistive, Touchscreen, Automation, Serial Communication, Labview, GUI.

I. INTRODUCTION

An enhanced, lower priced user interface the use of contact is a treasured feature for a range of consumer, medical, automotive, and industrial devices. In many consumer applications, designers decide upon high priced capacitive contact screens to resistive technologies because they can track a large quantity of fingers and seem to provide a friendlier interaction with the user. At present, less costly resistive applied sciences fill a market niche the place solely a single contact is required, extraordinarily correct spatial resolution is obtained. Hence, through this mission , our objective is to create a gesture recognition machine and henceafter feeding it to a domestic automation machine so as to fit the growing digitalization of the world.

II. EXISTING TECHNOLOGIES

Every work formerly was operated thru switches that had to be grew to become on and off manually. As the technology grows, the entirety has gone embedded. To bring down the complete of the electrical gadget of a place, to a screen is an instance of embedded system.

III. WORKING

3.1 Description

Basically the challenge converts the analog voltage coming from the resistive touch display screen into a two co-ordinate integer value and sends it to the PC via the microcontroller. The processing code takes these co-ordinates as inputs and attracts a white dot for each co-ordinate, on the output screen. So when you write consistently on the contact screen, the dots would be plotted close adequate to make it seem like a line or curve.

Fig.1. Touch Screen, ATMEGA16 Development Board & PC Running Processing

3.2 ATMega16 Code Explanation
-Map the four pins of PORTA in the following way using “#define”
#define y1 PA1
#define x2 PA2
#define y2 PA3
#define x1 PA4
- Initialize the USART and ADC features of the microcontroller.
- Enter into an limitless while loop
- Organize x1 (PA4) & x2 (PA2) as outputs. Set x1 (PA4) to excessive (+5V) nation and x2 (PA2) to low (GND) state. -Read the analog voltage at y2 (PA3) using ReadADC(3) command. Store the discrete fee in the variable “x” -Configure y1 (PA1) & y2 (PA3) as outputs. Set y1 (PA1) to excessive (+5V) kingdom and y2 (PA3) to low (GND) state. -Read the analog voltage at x1 (PA4) using ReadADC(4) command. Store the discrete fee in the variable “y” -Transmit the co-ordinates in “x, y” format to the PC the use of WrCoord(x,y) function.
A software program „Processing“ was used to analyse the output when block diagrams in LabVIEW were in progress.

3.3 Processing Code Explanation

1. First we outline the output screen size and also fill the historical past with some colour using size(width,height) and background(value) functions.
Note: I have taken width=690 and height=540. You can take any values but make sure it’s element ratio is same as that of the contact display screen dimensions.
2. Next we need to create a serial connection, defining the COM port wide variety the place the board is connected and also the baud fee which is executed through the following lines
Serial myport;
myport = new Serial(this,"COM9",57600);
COM9 is the place my board is related to and I have used baud rate=57600 bps seeing that the software should hold up with my velocity of writing.
3. Next we want to call a function every time a data is on hand at the serial port. Then we need to examine the statistics and save it in a string type variable.
void serialEvent(Serial p){
String stringData=myport.readStringUntil(10);
if(stringData!=null){

```
stringData=trim(stringData);
int data[]=int(split(stringData,','));
if(data.length==2){
x=data[0];
y=data[1];
}
```

Since our ATMega16 is programmed to constantly ship the facts (line after line), two set of co-ordinates can also get into the “read” characteristic equal time inflicting errors. To keep away from that we use “readStringUntil(10)” (where 10 is the ASCII fee for a new line)instead of simple read. This is would assist in placing a mark between two one of a kind co-ordinate through skipping each time after a new line occurs.
The trim() feature is used to cast off fashionable whitespace characters such as space, carriage return, and tab. Example:”1009,1024/r/n” will be transformed into “1009,1024”

4. Next we break up the string to extract the x and y co-ordinate separately. For this we use the split(stringData,',') characteristic and store the co-ordinates in two specific address places of a integer kind array.
Example: “1009,1024” is cut up into and saved as x=1009 and y=1024

5. Now that we have the raw co-ordinate value, we want to convert them into a good range of values corresponding to the display size we are going to plot our sketch onto. For this we use the map(value, start1, stop1, start2, stop2) function. Where “value” is the incoming price to be converted

Start 1 is the decrease sure of the value's contemporary range “stop1” is the higher bound of the value's cutting-edge range
Start 2 is the decrease sure of the value's target range
Stop 3 is the higher sure of the value's goal range
Then the transformed co-ordinates are saved in variables “xcord” and “ycord”.

6. Lastly we draw a stable circle (with small radius) at the co-ordinate given via xcord, ycord variables using ellipse() function.

7. At any end of time you can clear the drawing screen by pressing c on the keyboard. This is performed by using the usage of keyPressed() function.

3.4 Setup Instructions

1. You can both bring together the code given using a suitable compiler like WINAVR with ATMEL STUDIO/AVR STUDIO or in reality burn the “slate.hex” file given below.
2. Plug in the converter the use of an USB cable. If you are connecting it for the first time then get the drivers hooked up and observe down the COM port to which the converter is connected. Go to System Properties> Device Manager and seem to be out for the converter by its title to see the COM port number.
3. Open the processing software program and copy paste the code given below. Remember to edit the COM port number.
4. Click on the play button and additionally turn ON the development board.
5. Now the use of your finger or a stylus, attempt drawing something onto the touch screen. If the whole lot is done proper then you need to see some thing on the output display screen window of the processing. The data can in the identical way is fed to Labview and hence after any other controller to supply the electricity to the appliance.

IV. INTERFACING

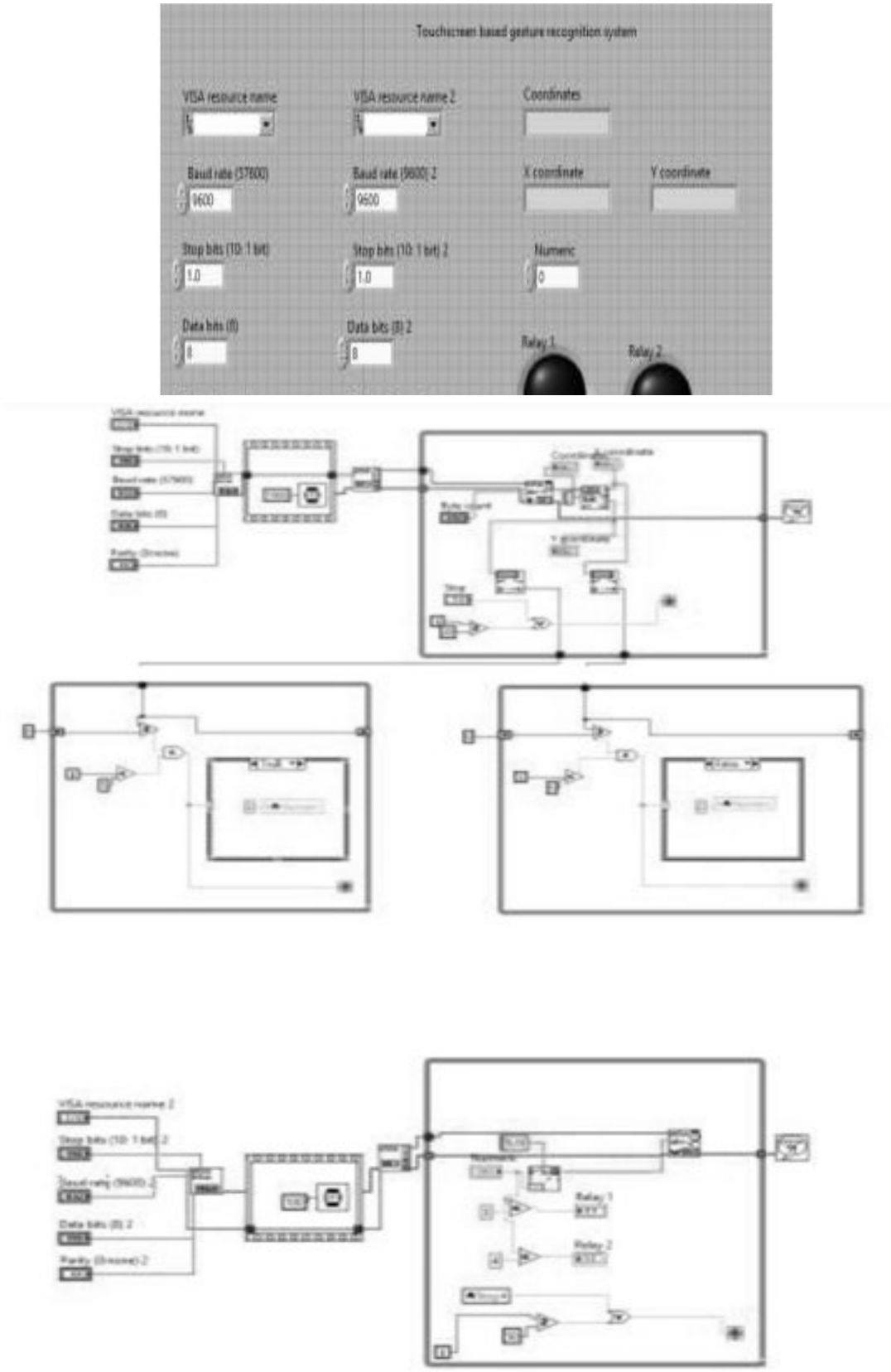

Fig. Gesture Controlled Touch screen Based Automation System

V. CONCLUSION

The conclusion therefore obtained is that the resistive touchscreen on interfacing with the ADC ports of a microcontroller can serve as a input to any software program of our preference and hence after be modified in accordance to software of requirement.

VI. FUTURE SCOPE AND APPLICATIONS

1. Proper tactile feedback as soon as hooked up would expand sensitivity of touch screen tremendously making its functions appropriate in security systems and biometric systems.
2. Technology will become a extra organic and herbal phase of our each day lives, commencing via eyewear, in which we are already seeing in development or eventually, through our our bodies turning into greater intertwined with technological know-how and for this reason the widened application in medical field.
3. Interaction with a host of contact sensors wrapped around the physique of the phone.
4. Interactions will be via the use of voice, gaze, gesture, or spatio-temporal Genius — the device will understand what user wants, earlier than you even have the inkling that one desires to be aware of it.

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