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作品名稱

Touch screen Clock

得獎獎項

Engineering Second Award

作者姓名

Abhilash Kammineni

Touch screen Clock

Abstract

The Touch screen clock is my school project and it is a digital clock and as the name suggests the only input for the clock is a Touch screen. The clock is extremely easy to use and is made to wake up lazy teenagers (like myself) in the morning and also so that I can just have a general purpose clock. The clock also has a built-in stopwatch, countdown timer and allows up to three alarms to be set which can be configured to go off on certain days of the week or just once – all of which have been designed and programmed in the software by me.

The clock has a 128*64 black and white Graphic LCD and has a 4-wire resistive touch screen stuck on top of the LCD. To control the LCD I have an AVR ATMEGA32 micro-controller attached to it and it is programmed using a Basic compiler called BASCOM-AVR. I didn't have time to develop my own PCB for the clock so I had to use a developer board.

First I wired up the LCD and made a clock that uses switches as the input while I waited for the Touch screen modules to arrive. Then after that I spent a lot of time to try to mount the Touch screen to the LCD as the Touch screen is made for a different size LCD. After about three weeks I found that using some tape was the most effective method and it would be easier to replace the Touch screen this way if I have to (as it only has a life of approximately 1million touches.)

Programming the Touch screen also proved to be difficult. The readings from the touch screen were very unreliable and so I have to filter out all of the bad readings in

the software. In the end I ended up taking many readings and if they were very similar then I accepted them as good readings otherwise I ignored them. I also made a command in the software which makes programming the touch screen a lot easier - I can check if a button on the screen has been touched in only one line of code.

I also took full advantage of the touch screen and introduced features which we can't have with buttons. When the alarm goes off I made the off button move around the screen so that you have to be awake to turn it off, not just turn it off half asleep and then go back to sleep. Also I made an algorithm which allows me to increase or decrease the time just by sliding my finger across the screen.

The touch screen clock is not just a clock but it also shows us where the future is headed – everyday items (such as clocks) will be made with touch screens. They make products extremely easy to use because you no longer have to figure out which button to push, you just touch what you want.

評語

本作品包含2部分,

- (1) 觸控式螢幕電子鐘,在此發展上作者展現了將其發展成可程式之全螢幕觸 控開關與控制面板的潛力。
- (2) 多功能之機械手臂,這部分亦與tic-tac-toe的一簡單人工智慧軟體結合,為 一極佳之機電系統之實施範例。

從此2部分中,作者展現了許多有趣的想法與紮實的技術訓練與能力。