

A10-041

作品名稱

無懈可擊**Impeccable**

隊伍名稱

得心應手 Handy

隊長

莊盛傑 南台科技大學電機工程系

隊員

王俊雄 南台科技大學電機工程系**作品摘要**

遙控器帶給人們相當大的方便，當人們坐在沙發上，遙控器玩弄於手指之間，享受隨心所欲的控制快感，遙控家電成為一種大部分人們生活的習性。市售的家電遙控器為了對付各種不同新增的功能，按鍵也越做越複雜而花俏。然而面對不同廠牌、不同種類的家電產品，其遙控器的種類、按鍵與型式也常常是不同的，導致一個房間可能擺了一堆的遙控器。而原本應該是帶給人們方便的工具，有時卻反而變成是特定人士的夢魘。尤其是對上了年紀的老人家，面對這些遙控器有時真是不知所措。

基於以上的問題，本作品的目的在於設計一遙控器，遙控器上只有一顆按鈕，透過這一顆唯一的按鍵要使多個家電依照自己的意思動作，如電視、音響、DVD播放器等，作出開、關、聲音、選台、等各種動作。如此將可以增進遙控器操作的靈活性，對特定人士將提供更為方便的操作方式。

本作品引入自然法則，來設計用一顆按鍵操控家電。本作品以紅外線無線傳輸結合三軸加速計與一顆按鍵，不必更改現行任何家電的控制方式，便可讓現有的家電隨按鈕動作，是本作品特色之一。

遙控器主要組成Microchip 公司的PIC18F4620單晶片電

腦，紅外線LED燈、紅外線接收器、Analog Device公司的ADXL330K 三軸加速計、Chipcon公司的CC2420 Zigbee晶片。

CC2420晶片則用來搜尋空間辨識器的狀況，如有接近者則要求空間辨識器將附近的家電資訊告知遙控器，以便進行智慧型的遙控。

空間辨識器主要組成Microchip 公司的PIC18F4620單晶片電腦，紅外線接收器、Chipcon公司的CC2420 Zigbee晶片、4X4 Keyboard、與文字型LCD顯示螢幕。

空間辨識器為內部儲存有家電遙控的資訊，這些資訊可藉由4X4鍵盤輸入並且藉由LCD螢幕的顯式來進行產品選擇。空間辨識器也可以透過紅外線接收器來獲得未知代碼的遙控器。當空間辨識器具有附近家電遙控訊號的訊息後。接著便由Zigbee作為與移動的遙控器溝通，並將適當的家電資訊傳給遙控器，在不更改現有家電的前提下，達到只以一個只具一顆按鈕的遙控器，控制不同房間、不同廠牌的家電，使控制器本身更符合智慧型人性化的特性。

指導教授**許毅然 南台科技大學 電機工程系**

- 成功大學航太所控制組博士, 現職為南台科技大學電機工程系副教授。
- 連續7年獲得旺宏金矽獎、連續4年獲得國際發明展金牌獎6面、連續9年獲得教育部微電腦比賽獎項, 指導學生獲得榮譽超過五十項, 國內外專利將近五十件。
- 研究領域: 人性化智慧型系統、伺服機電控制、遠端監控網路、機電整合、單晶片應用。

**Abstract**

Remote controllers bring more convenience for the people. They sat on the sofas and used the remote controllers to operate the appliances more easily. Remote control has become part of the home entertainment system. Current remote control has become more fancy and complicated by added more functions. However the remote controller is different from the others for different types and different manufacturers such that many controllers in a room and it causes inconvenience for uses, especially for elder users, and contradicts its purpose of convenience.

This product features remote IR transmission to our home electronics and no functions modification is required on the current home electronics. Our design based on natural behavior is able to make functional controls only by one button, such as power on/off, volume up/down and channel change, etc. The remote controller will smartly identify the room space and send a correct IR code with the same

controller even if the manufacturers the controlled appliances are different. It will be a brand new experience and definitely benefit some people, such as the aged.

The remote controller combines a microcontroller, an IR led, an IR receiver, a 3-axis accelerator and a Zigbee chip. A PIC18F4620 chip manufactured by Microchip is as the microcontroller. An ADXL330K chip manufactured by Analog Device is as the 3-axis accelerator. An CC2420 chip manufactured by Chipcon is as the Zigbee chip.

The Room identifiers also combine a 4X4 keyboard and a LCD display. The keyboard is used to input the information of the controlled appliances. And the information of the controlled appliances can also be got by an IR receiver in learning mode. The Room identifiers can point out the information of the home electronics around. The remote controller will ask the nearest room identifier to translate the information. Then it will intelligently send the proper controlled codes by only one button.



The left device is remote controller, and the right device is room identifier. The room identifier points out the information of the home appliances, such that the remote controller will intelligently send the proper controlled codes.

