



## 作品名稱

### 嵌入式熱感串流影像擷取系統之性能提升

Performance Enhancement of an Embedded Surveillance System with Video Streaming Recording Triggered by an Infrared Sensor Circuit

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## 作品摘要

本專題提出一種針對家庭監視系統的解決方案，強化焦電型紅外線感測電路，以提高感測靈敏度以及感測距離。此系統家庭視訊監視功能亦兼具以下特點：

### 1. 以嵌入式系統來實現區域監視系統

利用嵌入式系統可執行網路連結功能、低功率消耗、體積小、且成本低，另外也提供日後可以SoC化等優點，來建構整個監視系統，並在系統上建立網頁伺服器，利用網頁瀏覽方式提供所監視現場的即時畫面給使用者。

### 2. 外部紅外線感測器感測環境溫度變化偵測人體

我們利用焦電型紅外線感測器來偵測人體經過，觸發訊號輸入嵌入式板的I/O當作中斷，並且執行Camera擷取即時畫面。此機制可以達成縮短儲存影像時間，降低記憶體使用長度。

### 3. 提升焦電型紅外線感測器的感測準確度

由於焦電型紅外線感測器對於周遭溫度的變化不是很敏感，在環境溫度較高的情況下也存在較高的誤動作率，因此我們提出了一種“多數決投票機制”的方式，利用一群感測器當作一個感測群體，當此群體過半數的感測器都發出觸發訊號，才對嵌入式板送出外部中

## Abstract

In this project, we propose a design for a home surveillance system which enhances the pyroelectric infrared sensor (PIR) circuit. In addition, we promote the sensing sensitivity and sensing distance. Following are the features of the embedded surveillance system.

### 1. Implement the home surveillance system with embedded system

There are many advantages of using an embedded system design, e.g. low cost, low power consumption, small size and an on-chip system. Besides, we can construct the Boa Web server in the system. The users can monitor the surveillance area by means of the real-time images captured by a webcam via Internet.

### 2. Use PIR sensor to detect human body by the variety of environmental temperature

The system detects a human body by means of external PIR sensor circuit. When the signal is triggered, it will be seen as an interrupt input to the I/O of embedded board. At the same time, the system will capture real-time images. In this way, it can avoid wasting any memory used to store images.

### 3. Promoting the sensing stability of PIR sensor

The PIR sensor has higher error detection as the environment temperature becomes higher. Therefore, we propose a "Majority Voting Mechanism" using several sensors as a sensor group, if more than half of sensors in the group are triggered, the sensor majority circuit will transmit a trigger to the embedded board to activate stability enhancement.

### 4. Enhance the quality of captured images by using light controller module

The environmental illumination near the surveillance area is variable. When the illumination is weak, it will cause a digression of the capturing quality. Therefore, we avoid any environment illumination affecting the capturing quality. We implement the light controller to judge the illumination and control the light in the surveillance area.