

# 13<sup>th</sup> GOLDEN SILICON AWARDS

## A13-186

All in the suitcase – Lego-like portable LED bulletin board & application of wireless transmission.

一箱搞定一組合式 LED 行動電子看板與無線傳輸之應用

### 隊伍名稱

行動派女郎 / Ladies in action

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### 作品摘要

LED電子看板已普遍應用於日常生活中，舉凡車站、車廂、醫院、大賣場、店家門市、甚至夜市攤販等大小場合皆可見其蹤影，其重要性不言而喻；有鑒於此，我們的作品：一箱搞定-組合式LED行動電子看板與無線傳輸之應用，由傳統LED電子看板發想，不僅具備了既有產品之基本功能，更增添了一些貼心創意，讓它在可攜性的應用場合持續發光。

從軟體操控的方便性而言，本設計結合了目前火紅的智慧型手持裝置與精巧、友善的APP設計，讓使用者可以無線傳輸(藍芽)，即時更新看板訊息，相較於傳統LED電子看板，大多是以有線傳輸方式(例：RS232)為之，顯然方便許多。另外，一個精心設計的PC端軟體，讓使用者可設計專屬的圖案(icon)，並顯示於看板，換言之，使用者擁有更多自由揮灑的空間，去凸顯各別LED電子看板間之差異性，而無需求助於製造商。

另一方面，從硬體組裝的多變性而言，我們以中文特有的文字結構為出發點，結合樂高(Lego)積木的概念，將模組化的概念融入LED電子看板中，在電子與機構的巧妙搭配下，使用者可輕鬆地讓看板呈現多變的幾何造形(M行/N列)，具備「可變性的結構」這一特色，已非多數傳統LED電子看板所能辦到的，更重要的是，這些LED點矩陣模組具備自動點名之功能，也就是說，每塊模組能夠在開機瞬間自我判斷處於幾何行列中的位置，而過程中無需做額外的硬體定址！另外，自動點名過程中也可輕易檢視出功能異常的模組，大大減少了偵錯、維修的時間。最後，電子看板於拆解後，各個模組可輕易堆疊、收納，徹底滿足「一箱搞定」之訴求。

最後，考量電源選擇的機動性，我們採用雙電源的設計，讓使用者依照環境條件自行選擇使用市電或行動電源，讓本產品的可使用性達到最大化，真正實現行動電子看板之初衷。

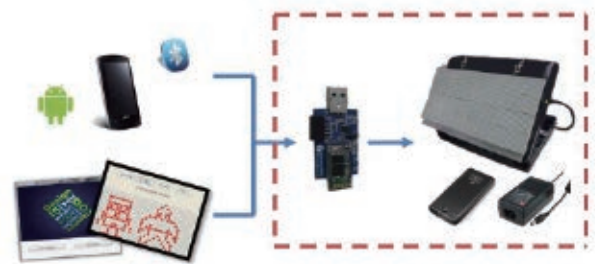


圖1 > 系統架構圖



圖2 > 特色說明圖



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分別於 1984 年及 1986 年取得交通大學電子物理系學士及交通大學電子研究所碩士。畢業後至業界工作，自 1991 年轉任聯合大學電子工程學系助理教授迄今。

**研究領域**

微控制器 / FPGA/ 感測器之應用、無人車（教導式自動停車、巡軌車、GPS 導航無人車）車載資訊（CAN Bus）、節能控制（紅外線 /RS485/Zigbee）。

**Abstract**

The LED electronic bulletin board had been being used widely in the modern world. It may catch your attention any time at these places, such as railway stations, hospitals, supermarkets, shops, and even the night markets. The growth of usage explained the importance of these bulletin boards. Therefore, our creation - 《All in the suitcase》, the Lego-like portable LED bulletin board & application of wireless transmission, which not only kept the basic functions of conventional design but also possessed some originalities, and that enhanced the LED electronic bulletin board in the portable applications.

Combining the hottest hand-held smart device with an ingenious homemade APP, that made the contents on the bulletin board be updated instantly through the bluetooth interface. Compared to the conventional LED electronic bulletin board, which needs a cable for transmission (ex:RS232), the former is more convenient obviously. Moreover, using another original human interface software on PC, user can design any pattern to be displayed on the bulletin board as their wishes. In other words, user can re-configure the visual style of the LED electronic bulletin board on their own without the support of manufacturer.

On the other hand, from the viewpoint of chinese character, the LED electronic bulletin board had been modularized mechanically. That is to say, by use of the Lego-like modules, user can re-organized the bulletin board into any M×N physical matrix in a few minutes. Furthermore, the Lego-like modules of the bulletin board can locate themselves (so called: attention!) in the matrix without any jumper setting on the PCB. Also, any malfunctioned module can be picked out easily during the attention process, and that will save lots of the effort of system diagnostic. Finally, all the modules of the LED electronic bulletin board can be packed neatly in the suitcase.

Considering the mobility of the bulletin board, there are two options of electric power for the system. Users can choose AC or portable power according to demands.



Fig.3 > APP operation

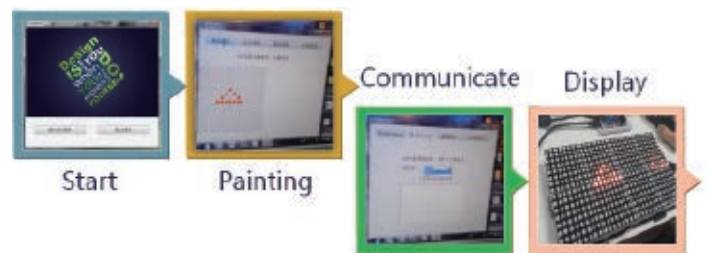


Fig.4 > UI operation