A11-043

作品名稱 **LED 路燈控制系統**
LED Street Lighting Control System
隊伍名稱 **玩味創意 Chew ideas**
隊　　長 **楊家維** 南台科技大學電機工程學系機電控制組
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作品摘要

全球的照明用電約占總用電量的 19%，為了節能減碳，美、英、日及歐盟等各國宣布自 2014 年起全面禁用與禁生產白熾燈，因而 LED 照明產業正蓬勃發展，中國大陸已積極推動「十城萬盞」計畫，將在 21 個試點城市應用 100 萬盞 LED 照明；臺灣全台目前約有 160 萬盞路燈，若全改用 LED 路燈，每年將可減少用電約 13.4 億度用電量，比較現行的路燈，整體省電效益約達 57%左右。

LED 路燈的優點不僅在於省電，長壽命、即時開與關、色彩與亮度調節等功能均為其特點，為達成此目的，LED 路燈必須具備一個控制電路，但由路燈之間距，此控制電路無法集中成一處，而必須分散到每盞燈上。因此，本專題開發了一套適用於長距離 LED 路燈的分散式控制方法，而且能適用於任何數量及任意增減 LED 路燈的系統。 此系統能隨時刻、周遭照明及路況分別變更個別路燈之亮度與色彩，例如，於濃霧之路段由白光改便為黃光，或於危險路段以紅色標示，而個別 LED 路燈控制模組也可自行依周遭照明狀況調整燈光亮度，節約耗能消耗。

ABSTRACT

The present intelligent street lighting control system, consists of a central control unit, a serial interface and a serial data transmission network, and plurality of LED street light lamps; the central control unit generates a control signal transmitted through the serial interface to the serial data transmission network, on the network there are plurality of LED control modules, which receive the control signal to control the lighting effects of the street light lamps; various operating status of each street lamp can be feedback via the serial network to the central control unit. An emergency button can be installed on the street light lamp pole in this system, if necessary to change the lighting color, meanwhile its ID number will be send back to the central control unit, so the authorized manager in the control central can monitor each street light lamp in entire lighting system, improve the utility of street lightings, and enhance the road safety for people and vehicles.

A11-054

作品名稱 **子彈**
Bullet
隊伍名稱 **消失的學長 upperclassman disappeared**
隊　　長 **林聖紘** 龍華科技大學電子工程學系
隊　　員 **王哲彥．符信茂．吳玉誠** 龍華科技大學電子工程學系
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作品摘要

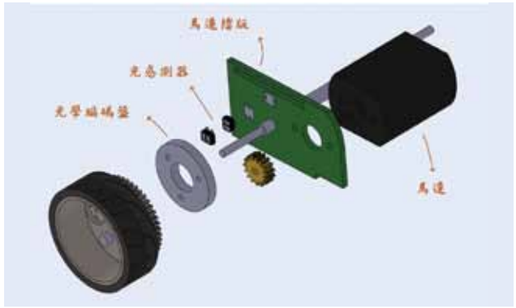
本平台想要建立一個具有電腦鼠走迷宮、競速自走車、循跡線迷宮鼠三種功能合而為一的平台，用以當作各個學校的教學教具。本平台整合資訊、電子、電機、機械等知識的機電整合平台。並且包含電源電路、感測電路、馬達電路、CPU 電路等四大部分，配合電池、機身、結構、車輪、輔輪、致動件等硬體以及作為邏輯判斷的程式流程軟體，整合了多方面的知識領域，因此非常適合作為機器人或單晶片嵌入式控制系統的教具。

本平台可依個人需求不同，而使用在不同功能上，藉由學習此平台可讓初階學習者更快學習上手，可依照學習者的興趣取向選擇學習方向，因在此平台上有著不同的功能取向，讓此平台更加符合學習者的需求。也因此平台價格低廉，一般學習者在學習使用上無經濟壓力負擔，平台上的三種功能也能運用於全國技藝競賽裡，讓學習者也能藉由競賽的方式讓自己學習更有成就感。

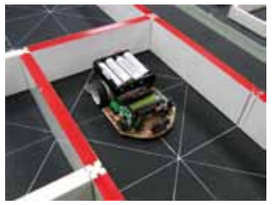
ABSTRACT

We proposed a platform which integrates the maze robot, line following robot and line maze robot. The platform contains control theory, firmware programming, electronic engineering, and the mechanic design. Students can learn many practical skills, including power circuit design, DC motor control, sensors detection and micro-controller applications, by implementing the teaching platform. Hence, this course contains much relative knowledge and is interesting to draw much attention from students.

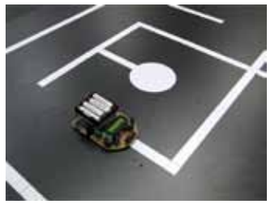
To deserve to be mentioned is that the platform can be used by most people. Junior students can learn the basic topics and develop the necessary concept of hardware circuit. Senior students can further implement the advanced firmware programming and control theory according their ability and interests. Many students are able to buy it because the platform is cheap. Furthermore, students can be interested in the relative course and learn the practice skills to increase the job competition by implementing the hardware circuit, firmware programming and joining the national contest.



自製編碼器爆炸圖


電腦鼠走迷宮


競速自走車


循跡線迷宮鼠


自製編碼器實體圖