

A13-213

Intelligent Bird's-eye View Surveillance System

智慧型鳥瞰式監控系統

隊名	鷹眼神攝 / The Hawkeye
隊長	張志豪 中央大學電機工程學研究所
隊員	黃至祺 中央大學電機工程學研究所 黃泰維 中央大學電機工程學研究所
指導教授	蔡宗漢 中央大學電機工程學研究所

作品摘要 Abstract

本系統融合了前景偵測演算法、前景物件標籤化演算法，以及攝影機幾何校正、攝影機間資訊匹配與融合演算法。在系統實現的層面上，採用嵌入式平台來實現，來整合上述的電腦視覺。因以嵌入式平台來實現，故將來移植於攜帶式消費性電子產品時將相對的便利，因此，使用者可於消費性電子產品中如智慧型手機使用本系統，當我們擁有該地區之網域地圖影像以及監視攝影機畫面後，即可快速且方便地監控此地區。而GPS (Global Positioning System) 全球定位系統可將人物位置資訊整合進一地圖影像中來達到定位之功能，但因須有衛星資訊等原因，造成室內無法得知此人與該地區環境相對應之關係，本系統整合多隻攝影機重要資訊進一廣域地圖影像中可達成猶如GPS定位之功能，即可解決室內收不到衛星的問題。上述的功能總結了我們的總體目標：設計出一個具更高層次智慧以及更具人性化監控的系統，並且可用於戶內或戶外，針對人群或車輛之監控，提昇整體監控網路的效率。

In recent years, closed-circuit television system was replaced by digital surveillance system. Digital surveillance system provides high quality of video and more convenience to store and transfer. Therefore surveillance system has become more and more popular. There are many digital surveillance cameras in every place such as street and corridor. However, people are hard to observe numerous monitors at one time, and usually loss some important information. Thus an intelligent surveillance system is needed to solve these problems.

In order to get the important information from surveillance camera, firstly we do the background subtraction to separate the foreground/background information. In our system, we do not need to know the 3-D coordinate in real-world, and require an accurate camera calibration either. We utilize the direct linear transform to know the special relationship. To map the information to bird's-eye map, we have to label the foreground segmentations and note down the position. With these position and transformation information, we can see what we are caring about in a bird's-eye map clearly. With this system, we can position the object like the GPS even though it is indoors. The results show that we can integrate the camera information into the bird's-eye map. The proposed system can provide more functionality of the monitored site, and the operator can observe a wide range of monitored site easily.



Fig.1 >Two objects are captured from camera 1



Fig.2 >One object is captured from camera 2

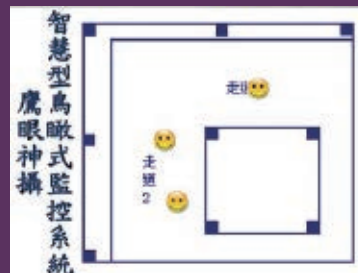


Fig.3 >The result show that we can integrate the camera information into the bird's-eye map