The Chinese University of Hong Kong

Intelligent Car Park System

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*Abstract*

This project is trying to using existing equipment to improve car park management system. Appling the computer vision technology and algorithm design, we hope that the new management system can automate management processes by computer.

*Goal*

In the 1st semester, we would like to figure out what methods can we only using static camera to approximately distinguish the size of car so that we can automatically assign the position to the car in the following semester.

In fact, this project consists a lot of technical constraints to achieve the goal. For example, the unstable brightness of car park entry, object detection and tracking, height and distance of camera setting, movement of cars (Determine car is moving or not) etc. Hence, we have focusing on a lot of computer vision experiments to investigate and figure out the suitable solution in the 1st semester.

*Background*

CSE has several FYP car park management systems developed in previous years. They concern about the in-out records and checking empty slot. To tell driver where is the empty slot rely on human to assign the parking slot. In this project, an intelligent car park management system is developed to replace the human assignment. In other words, the system should recognize the size of incoming car and determine the best fit location for the car based on the on site situation.

*Technology*

Operating System:

* Linux Ubuntu 16.04 64bit

Programming language:

* C++

Tools/library:

* OpenCV

*Experiment*

To implement object detection in our management system, we would implement in the following algorithm.

1. Background Subtraction
2. Calculate object contours
3. Filter useless and incorrect object in the screen

*Areatotal  = AreaObject + AreaObject Shadow*

-Rectangle area != object area (because they only count area)

-Focus cannot auto (will change the background image, because learning = false)

-Rainy day so many shadow

-high, 45 degree