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| Student Name: Jianyu He | Student Number: D17124591 |
| Mobile Number: 0876070764 | Supervisor: Martin Mchugh |
| Programme Code: DT228 | |
| Project Title: space chceker | |
| Summary (approximately 200 words)   The goal of this project is to improve my programming skills during class and learn more knowledge from internet and this project, I think this will be big challenge for me.  My project is to design a application use to check amount of car and car space in car park by cctv. The application is going to show total car space of car park, how many car exist in car park, how many car space available and a simple car space map on the website that driver can check car space on the website, this application is help for driver to check does car space available in car park and do not need waste time to check car space in car park. I will use postgresql to create a database for my project. This database will store total car space, space available, car exist, date and time.  For this project, I do not want coast money to purchase a cctv and set into car space, so I would like to use video from car park to test this program. | |
| **Background (and References)**  As the Population expansion and for the convenience of travel, more and more people buy cars.[1] is describe why people like to use car, that is to help to analysis why people have to but car. As results some car park may very busy, that I design this application to help drive do not have to waste time to check does any space left. [2] is describe how sense of time is important for human development, that is help me to help to analysis how my project will help people. Python is best programming language use computer vision to process images.[3] this book is describe how to use python in computer vision, that is help me to think how to design my project. [4] this book is describe how computer vision can help for car follow, that is help to design my project.  References:  [1] LindaSteg, 27 February 2004, “Car use: lust and must. Instrumental, symbolic and affective motives for car use” <https://www.sciencedirect.com/science/article/pii/S0965856404001016#>!  [2] Laura L. Carstensen, 2006, “The Influence of a Sense of Time on Human Development” <https://doi.org/10.1016/j.tele.2006.03.001>  [3] Joseph Howse (2013) “OpenCV Computer Vision with Python” <https://books.google.ie/books?hl=zh-CN&lr=&id=OQm3gNQ7xGcC&oi=fnd&pg=PT8&dq=python+with+computer+vision&ots=42ppJZep_1&sig=NA0_MWfJP_kOKBO3qR91GyYtCbE&redir_esc=y#v=onepage&q=python%20with%20computer%20vision&f=false>  [4] T. Zielke ; M. Brauchkmann ; W. von Seelen, 2002, “computer vision-based car following”  <https://ieeexplore.ieee.org/abstract/document/240316> | |
| Proposed Approach This application is going to design by opencv using python programming language, the main method is use Mask R-CNN to find position of cars, use cv2.puttext to output total space, car space left and amount of car. I will use pycharm to create a Django project to deploy a website and use postgresql to deploy a database, on the website shows name of car park, total car space, number of car, number of car space available and a simple car space map show a status of car space used, all information will store in the database.  I choose waterfall methodology for my project, I will follow step by requirement, analysis, design, Implementation, testing, development and maintenance. I believe this methodology is more helpful for my project.  This application is 3-tier structure, it have presentation tier, application tier and data tier.  Requirement:  I am going to find what is the good idea for this project, then clear and define the idea.  Analysis:  I will to do a lot of research to think about how this project look like, what function this application will have, what programming language I will use, what area will use for and so on. Then I discuss about my project with teacher in class.  Design:  I will be going to do some paper work to show structure of space checker to show each function. Then I will create use case diagram, class diagram, sequence diagram and erd for space checker.  Implementation  I will follow design to design code for space checker. If I meet error I will to do research from internet to solve problem.  Testing and evaluation:  When I finish implementation the design, first I test code to make sure it is no error, then I will ask somebody to use my application and evaluation to find any error or problem is existing, if it exist then I will fix the error then test again. Also I will get evaluation from user, this will help me to find what is good or bad in this project, that I will know how to improve this application.    Maintenance: I will get advice from user who test space checker then update it. | |
| Deliverables project dissertation  Software and Configuration Files  Demo  Final report includes everything I did in the project | |
| Technical Requirements Laptop  opencv  postgresql  Django  pycharm  Python language | |

## Project Reviews – Please include reviews of two of LAST 2 years projects from either DT228, DT282 or DT211C.

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| **Project 1**  **Title:** Euro Coin Classification Using Image Processing & Machine Learning  **Student:** Yumin Chen  **Description (brief):**  this project is through suitable mathematical model to recognition denomination of euro coin.  The main technologies involved in this project are image processing and machine learning. For Image Processing, computer vision techniques are used to process the image-based sample dataset and extract features. Machine Learning is used for predictive data analytics to build the models of generalized euro coin denominations.  This project allows human easy to calculate a large number of money.  What is complex in this project  Visual object recognition is one of the most challenging computational problems in machine vision. Human can easy to recognition any euro coin but machine can not, so have to create an artificial recognition system.  What technical architecture was used  JSON language, image processing techniques, machine learning techniques, data mining techniques, computer vision techniques, statistical techniques  Explain key strengths and weaknesses of this project, as you see it.  The strength of this project is allowed user easy to calculate money  The weakness of this project is this application have to scan each coin sometime is not necessary. | |
| **Project 2**  **Title:** **Image Selection Based on Optimal Characteristic Analysis**  **Student:** Jameel Briones  **Description (brief):**  This project is through compare Basic image properties such as sharpness, noise level, exposure and contrast will be analyzed to test for the image’s quality to find similar image then category. User can share the image to social media site.  It helps user to tidy up images.  What is complex in this project  This project have to research and implement a good image comparison algorithm can to use to compare image’s quality.  Have to assessment measure for different image properties that can affect image quality    What technical architecture was used  Python language, opencv, image processing technical  Explain key strengths and weaknesses of this project, as you see it.  The strength of this project lies on the image quality assessment. The tests performed has produced a higher success rate than the image comparison, often matching human’s assessment of image quality. The image assessment is also made more efficient due to multithreading. It also provides a share functionality in the application.  project’s weaknesses lies on the image comparison. It may be accurate in a few samples, but it can also have a few outliers resulting from its brute force matching of its descriptors. Because of this, it often leads to an inaccurate matches of the images. It can also be quite slow at times, depending on the image size and quantity to be compared. | |
| Proposal Sign off: | |
| **Student Signature:** | **Date:** |
| **Lecturer Signature:** | **Date:** |