TechShopBD Project Competition

Participant Details:

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Project Details:

Project Title	CCTV Footage Based Automatic Car Parking System.
Project Description (500-800 words)	(1) Every parking place must now have a **CCTV** in the current day. This **CCTV** footage served as the basis for my project, which employed the "**Image Processing**" method. We will identify vacant parking spaces and spaces that are not empty using **CCTV** footage analysis. Depending on the outcome, it will let a car to enter a parking spot. The driver of a car may check the number of available slots via an LCD display that has been installed at the parking space's entrance before entering.
	(2) Stopping the usage of "**IR Sensor**" to automate parking garages is a particular aim of this initiative. In my project, no **IR sensors** are utilized.
	(3) When every parking space is occupied by cars and a car tries to enter, the parking gate won't open and a buzzer will ring.
	(4) If there are any available slots, the gate will be opened and the LCD display will indicate the free slot numbers.
	(5) If a vehicle wishes to depart, the parking gate must be opened.
	(6) When there is available slots in parking space, the RGB will emit green light. If there is no slots available RGB will emit red light and if any vehicle

wants to go out from parking space then RGB will emit blue light.

(7) A phone camera is used as CCTV and it is connected via USB cable to computer.

About the video file –

1) Left part of the video is captured by an external phone. Check LCD display in this video very carefully if it is displaying correctly as well as it is observed that every function of the project is working properly. "CAMERA" heading is used above it.

2) Right part of the video is our **CCTV** footage which we analysed and depending on the data we got, we communicated with arduino .

(*) I am extremely sorry for a little bit external noise in video file.

About Programme Files -
There are five files of program. First three are used for image processing technique . And the fourth one is for transmitting data to arduino. And the fifth one is Arduino sketch.

1) ParkingSpacePicker - Using this program , we will define the parking slots and entry and outro position of the parking. We have to mark entry first , outro second. Then 1 to last . CarParkPos file generated using the positions of parking slots. Height and width are set manually in this programme. And this height and width value are used in next 2 programs. A binary file names as "CarParkPos" is generated where the locations of parking slots are stored by this program.

2) mainWithTrackbars - In this program we have found thresholds and median value .
Thresholds values are used to make threshold image

	and median value is used to make median. Gaussian Adaptive Threshold method is used here. 3) main - This is the main file . Putted threshold and median value in this code what we got from **mainWithTrackbars** program. Height and width are set what we got from **ParkingSpacePicker**. And array is generated in this programme . If any car at any slot , it will generate 1 else 0 . 4) controller - Array got from main program . and using this value , LCD display, RGB ,servo motor and buzzer are controlled. This first four programme files are written in 'python' language. 5) Arduino_sketch – 'Standard Firmata' sketch was modified to use LCD display in this project. Then it was used as Arduino sketch. This is written in C++ .
Application of the Project	Bangladesh is one of the nations having a highly populated area. The Peoples' main problem is transportation and vehicle parking as a result of the enormous population. The goal of this project is to use image processing to create an intelligent parking system. The Image Processing Technique may be applied in this Systematic Approach to Locate the Free Empty Parking space to Park Our Vehicles. The parking area might be designated with a lot of numbers in the proposed approach, making it possible to locate an empty spot to park a car without the use of any kind of sensors. In order to easily park the car in a vacant spot, the precise numbers can be shown. Finding open parking spaces in parking lots is a common challenge for drivers. This project shows an image-processing-based smart parking lot management system.
Components List	1) Arduino Uno. 2) Jumper Wires(male to male, male to female , female to female). 3) RGB led.

	4) Toy car. 5) Phone Camera (as CCTV) 6) Phone Tripod. 7) Servo Motor (SG90) 8) LCD Display with I2C Module. (16X2) 9) Buzzer. 10) Breadboard.
Circuit Diagram	
Demo Code	Github Link for code files- snip-animesh/Automatic-Car-Parking-Uni-Project-(github.com)
Output Image (720x360 px.)	
Output (If any) Video (1920x1080 px.)	Google drive link – Microcontroller Project - Google Drive
Caution	One major drawbacks of this project is , if we change camera angle we need to specify parking slots position and height-weight again .
Resource/ Reference	1) https://www.researchgate.net/publication/32181674 3_Image_processing_based_intelligent_parking_sy

👉 *to download this please click on the 'File' menu*

for any clarification or query feel free to call 01708166098

	[stem](#)
	2) [(PDF) A Smart Image Processing-based System for Parking Space Vacancy Management (researchgate.net)](#)