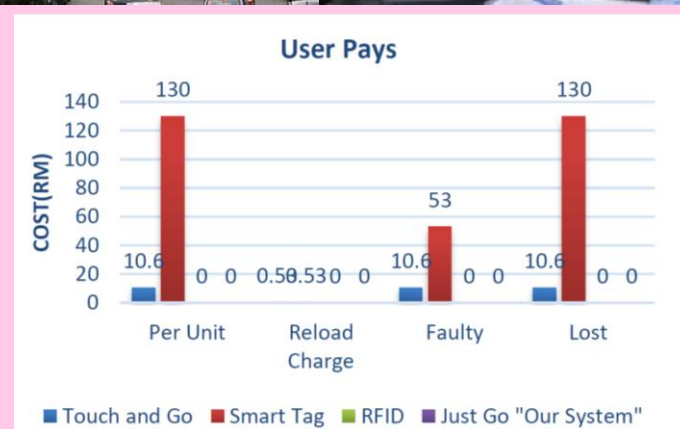


ABSTRACT

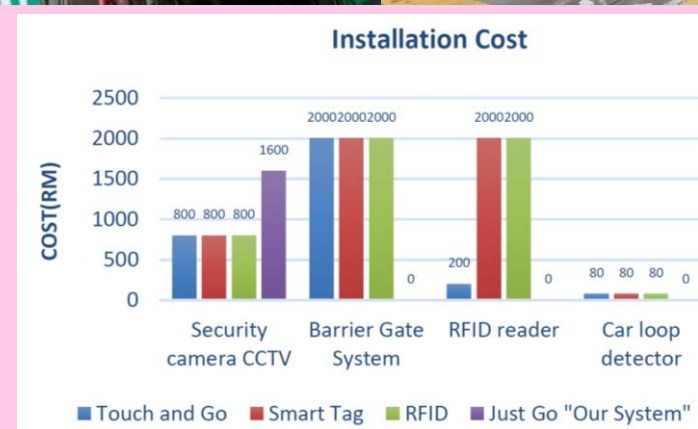
This project involves License Plate Detection-Recognition (LPDR) to develop an artificial intelligent end to end engine based on GPU server which enables computer systems to read automatically, detect and recognize the registration number of vehicles with a high accuracy. Besides, this project is to design a multi-lane free flow vehicle payment system and develop user friendly reload and payment "Just GO" application. LPDR engine will be designed to read all vehicle license plate types in Malaysia. It can be used at toll plaza, public parking area such as shopping mall, hospitals and hotels, drive through and petrol stations which can save time on vehicle payment, solve traffic congestion and help in tracking and security solution. Typically, our system only required security camera CCTV with our engine-based GPU server and it consists of three components which are object detection, text detection, text and character recognition. From the results, our system can reach almost human accuracy, recognize single and double rows plate number, detection and recognition multiple license plate in single image.

PROBLEM STATEMENT

Nowadays, vehicle payment on bridge, road charge (toll) or parking areas like shopping mall, hospitals and hotels, is one of the factors causing traffic congestion because drivers need to stop by the gate to pay. Some even reach the toll gate or parking gate and only realize that they did not reload their card "Touch'nGo" or pay their parking tickets. This is wasting time and causing congestion. The side effect of these problems is serious and need a better solution to handle it rather than Touch'nGo or Smart Tag systems that has a high implementation cost with inflexible payment and reload methods.



i) User charges compression



ii) Installation Cost compression

OBJECTIVES

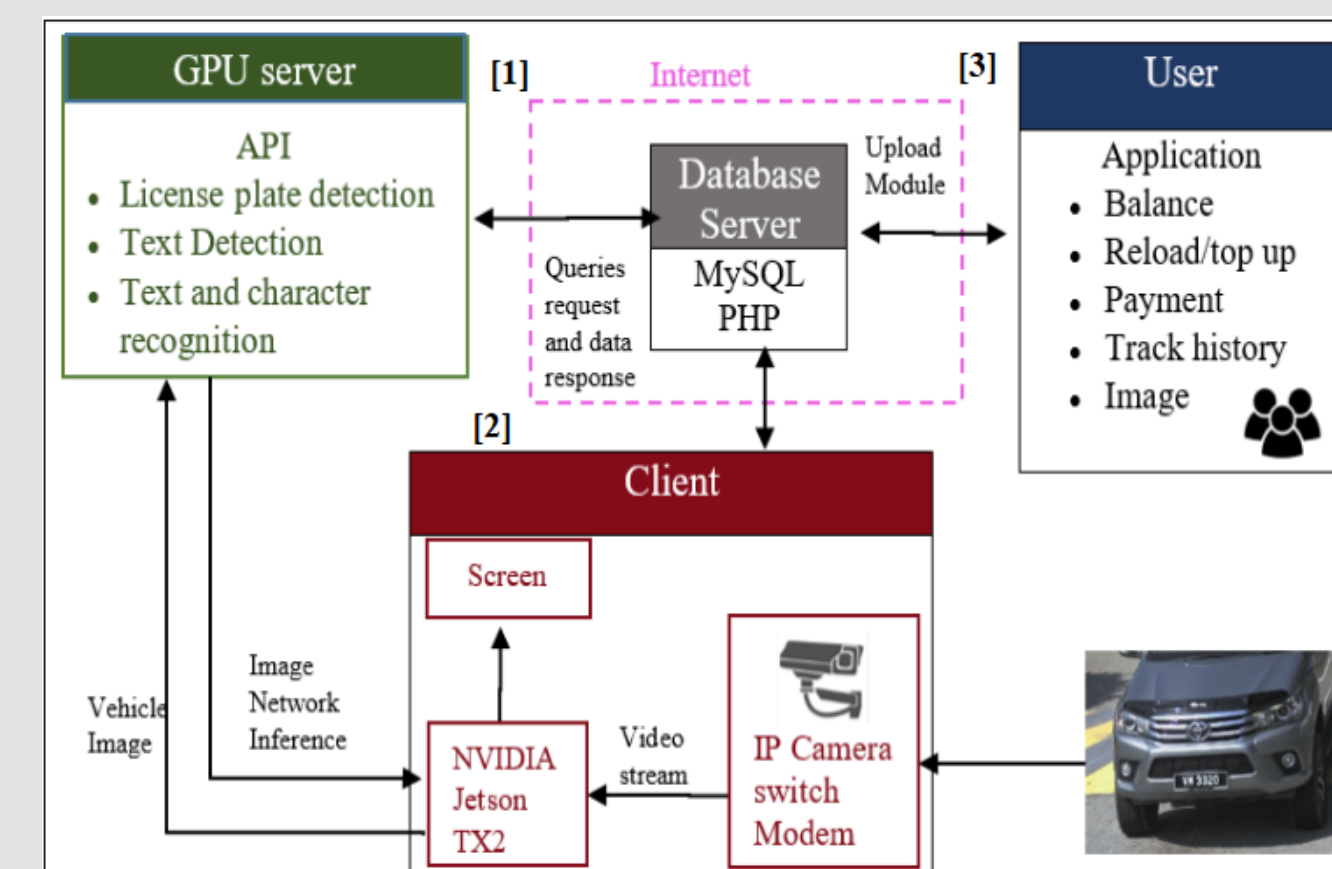
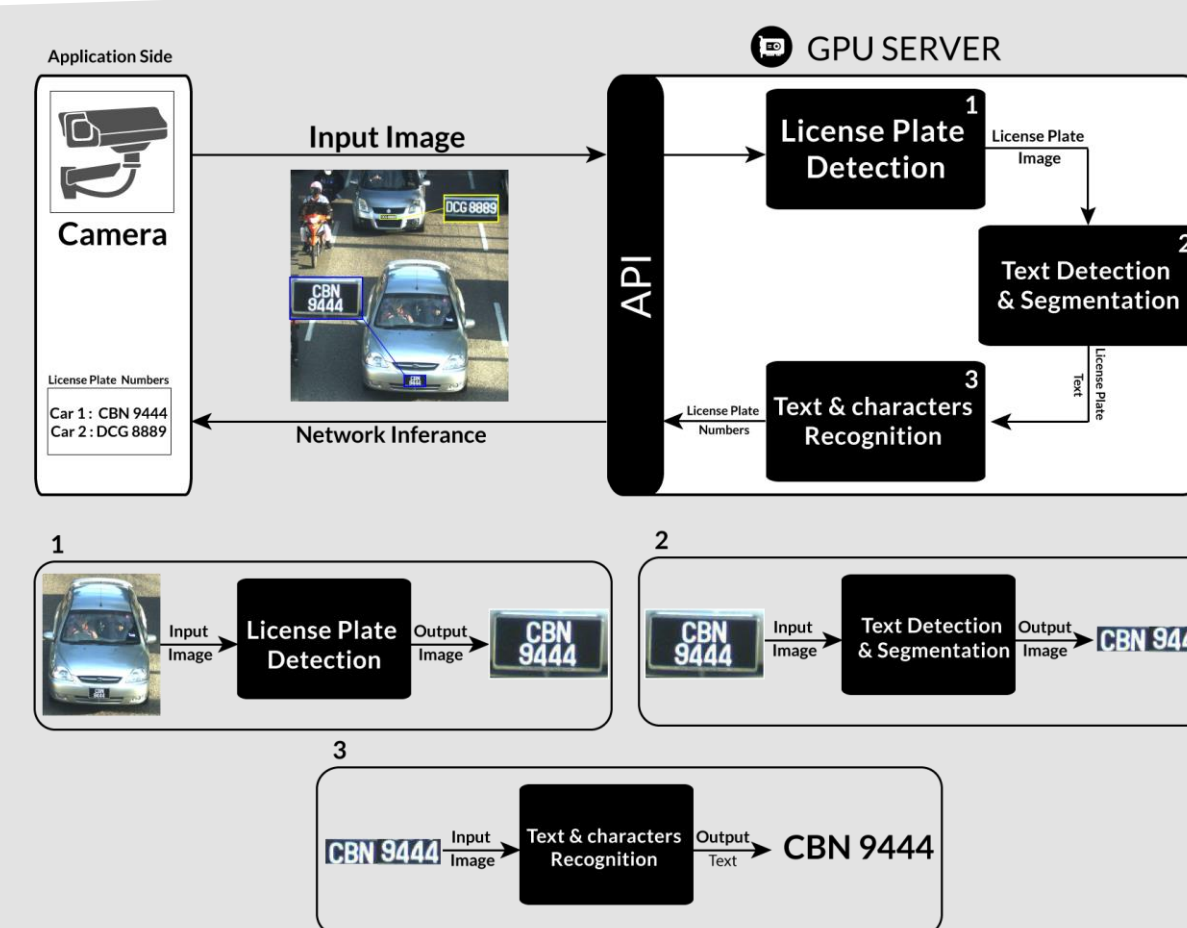
- To develop an engine based on GPU server which can automatically detect and recognize vehicle license plates using Deep learning with a high accuracy
- To develop engine for a variety of application such as, Smart Parking System which is able to identify parking space and assign a parking lot for entering cars, and save time on vehicle payment with license plate detection and recognition and help in tracking and security solutions.

PROPOSED SOLUTION



- Built an end-to-end server base system engine for License Plate Detection-Recognition (LPDR) with the use of deep learning advantages to reach to minimum error rate which can be implemented and used with different application and in different environment like parking systems and vehicle payment systems.
- "Just GO" Vehicle Payment System will be implemented with the core of License Plate Detection-Recognition (LPDR) engine which able to complete vehicle payment in a shorter time. Our system will use two cameras to capture the front and rear license plate of the vehicle. The system is typically consisting of three components which are Object Detection, Text Detection and Text and Characters Recognition. The system will first spot or localize the license plate in natural image and generate suitable bounding boxes (cropped image) according to the vehicle license plate. Next is to locating text in image. Lastly, it aims to identify the characters depicted within the bounding boxes or cropped image.
- All payment will be done in electronic, digital, cashless way by using our "Just GO" application. Traffic congestion at toll plazas can be solved as the system allows multi lane free flow. As well as save time and reduce parking congestion in parking areas.

METHODOLOGY



- [3] MYSQL as database management system with API and PHP as Web server scripting language to send HTML output to the application. The mobile application is dsign using Ionic to enable the user to check their account balance, reload or top up their account to make payment using online payment. They even can track their history with image provided.

- [1] The trained network begins with license plate spot or localize in natural image and generate suitable bounding boxes (cropped image) according to the vehicle license plate. Secondly, text detection in the wild is the problem of locating text in images of everyday scenes. It is a challenging problem due to the complexity of text locating, brightness, rotating position. This problem possesses a great importance for many trending applications, such as License Plate Detection-Recognition. Lastly, the system identify the characters depicted within the bounding boxes or cropped image. There are two different methods on plate recognition. All training of the networks has been done using PC with Nvidia Quadro M400 Graphics processing unit (GPU).

- [2]Python binding of the cross-platform GUI toolkit Qt Creator to cascade network pipeline the training on license plate detection and recognition. Secondly, Qt Creator also a cross platform software with live streaming of video or image capture for detection. The third part is to develop an inference between the system and the application for queries request and data response. For example, user data, balance and tracking on payment history. NVIDIA Jetson TX2 is an embedded computing device on client site for interface between the video or image collected to the main software in our GPU server for car detection, license plate recognition and tracking.



JUST GO Mobile Application

REFERENCES

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- [3] Shi, B.; Bai, X.; and Yao, C. 2015. An end-to-end trainable neural network for image-based sequence recognition and its application to scene text recognition.