

PUC Detection System Using Machine Learning

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ABSTRACT - Automatic number plate recognition technology is a method applied to smart cities in investigation and crime prevention. The recognized number plate is displayed on the graphical user interface and saved for future use in a database with time and date. Reducing the issue, such as cases of traffic violations, and improving safety in parking areas would be useful. In this project of moving vehicle number plate character recognition, computer vision technology plays a very crucial role. Photos are taken from video sequences to identify the characters on the plate. The fresh being faced is detection of PUC of the vehicles. Number plate characters are easily recognizable in the project from the deep learning algorithms built into our system. Registration number of the vehicle the serial number of the PUC the date on which the emission test was done. PUC test validity date. Emission test reading of the vehicle.

Key Words: PUC detection, pre-processing, classifier algorithm, feature extraction, image pre-processing, cascade classifier etc.

I. INTRODUCTION:

In various aspects of the fashionable world, the huge integration of data technologies has led to the treatment of vehicles as conceptual resources in information systems. Since an autonomous data system has no meaning with none data, between reality and therefore the data system, there's a requirement to reform vehicle information. This can be achieved by human agents or special intelligent equipment that will allow vehicles to be identified in real environments by their registration plates. Thanks to the calculation modules using location algorithms, segmentation plate and character recognition, the vehicle number plate detection and recognition system is used to detect the plates and then recognize the plate that extracts the text from an image.

1.1 OBJECTIVE:

This project proposes an automatic puc detection approach of user social media data using deep learning, this approach is going on use the concept of machine learning, deep learning models to extract feature from dataset. Pollution, especially air pollution, has always posed a serious environmental threat. The emission of gases from cars, such as CO, which degrades the atmosphere, is one of the most significant factors responsible for air pollution. A critical requirement here is to reduce the number of toxic gases released by automobiles. PUCs are often given solely on the basis of the vehicle's number, without any real diagnostics. Aside from that, the practice of having cars serviced on a daily basis has faded away. Random PUC checks can be eliminated with the aid of this method, and the process can be transparent, meaning no one can mess with the process in any way.

II. LITERATURE REVIEW:

[1] 23-level Single DC Source Hybrid PUC (H-PUC) Converter Topology with Reduced Number of Components: Real-Time Implementation with Model Predictive Control

Author: KEVIN-RAFAEL SORTO-VENTURA
Solar energy, in particular, is gaining popularity in many parts of the world. As a result, sufficient power electronic devices must be installed in order to meet the necessary grid power quality.

[2] "An Advanced Photovoltaic System Based on The Fifteen-Level PUC Inverter" Author: Youssef Ounejjar, Kamal Al-Haddad

The authors of this paper propose a 15-Level PUC inverter-based advanced photovoltaic system. The proposed inverter has the advantage of being able to generate fifteen voltage levels with a single PV array. Despite the fact that it only has eight switches and two capacitors, it can have a fifteen-level output voltage

[3] “PUC MEASUREMENT SYSTEM WITH INFORMATION PORTAL USING GSM AND RFID”

Author: Divyank Sunil Deshpande

The PUC Measurement Device is used to verify the carbon monoxide concentration in the engine. When an individual goes to a PUC centre to obtain a PUC certificate, he must first check the CO concentration in the car. He first places his RFID card in front of an RFID reader, and then sends a 12-digit unique code along with the CO concentration in percent to the RTO office via GSM modem. This SMS is received by a GSM modem connected to the central PC station.

[4] “Current Vector Control based on Average Capacitor Voltage Strategy and Hybrid Modulation applied to the Control of a 7-Level PUC Three-Phase Inverter”

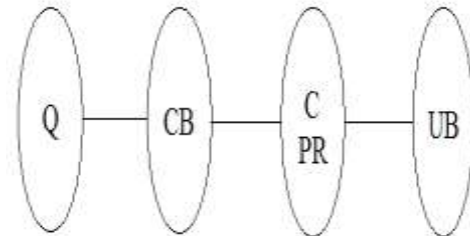
Author: Marcela Vialba Onizuka, Raymundo Cordero García Cyberbullying has received considerable attention, and experts have made several assumptions about this phenomenon. In particular, experts have speculated that the potential harm from cyberbullying is greater than that from conventional bullying, but this assumption has not been confirmed empirically. Due to the steady-state do load current referents being almost constants, which are easier to monitor than sinusoidal references, the proposed approach reduces the computational expense of the PUC controller, makes control tuning easier, and improves current control.

III. SYSTEM ARCHITECTURE:

3.1 SYSTEM ARCHITECTURE:



3.2 MATHEMATICAL MODELING:



Where,

Q = User entered input

CB = preprocess

C = feature selection

PR = preprocess request evaluation

UB = predict outcome

Set Theory

1) Let S be as system which input image

$S = \{In, P, Op, \Phi\}$

2) Identify Input In as

$In = \{Q\}$

Where,

Q = User entered input (dataset)

3) Identify Process P as

$P = \{CB, C, PR\}$

Where,

CB = Preprocess

C = feature selection

PR = Preprocess request evaluation

4) Identify Output Op as

$Op = \{UB\}$

Where,

UB = Predict outcome

Φ = Failures and Success conditions.

Failures:

1. Large database can also lead to more consumption of time to get the information.
2. Hardware failure.
3. Software failure.

Success:

1. Search the required information from available in Datasets.
2. User gets result in no time consistent with their needs.

3.3 SPACE COMPLEXITY:

The space complexity depends on Presentation and visualization of discovered patterns. More the storage of data more is the space complexity.

3.4 TIME COMPLEXITY:

Check No. of patterns available in the datasets= n
If (n>1) then retrieving of information can be time consuming. So, the time complexity of this algorithm is $O(n^n)$.

IV. ALGORITHMS:

4.1 TESSERACT OCR:

The main task is to recognize receipts from photos captured. Tesseract OCR was used as a primary tool. Library pros are trained language models (>192), different kinds of recognition (image as word, text block, vertical text), easy to setup. 3rd party wrapper from GitHub was used as Tesseract OCR was written on C++. The difference in version is in different trained models (the 4th version is more accurate so I used it). We need file with data for text recognition, for every language each file.

Better the quality of image (size, contrast, lightning), better the recognition result. Also, the image processing was found for the further recognition by the OpenCV library. As OpenCV is written on C++ and there's no optimal wrapper for our decision so I made my own wrapper for this library with necessary functions for image processing. The main difficulty is to settle on solutions for the filter for right image processing. There's also an opportunity to seek out receipt/test outlines, but it's not researched enough. The result was for 5–10% better.

4.2 OPENCV:

OpenCV, or Open-Source Computer Vision library, began as a search project at Intel. It's currently the most important computer vision library in terms of the sheer number of functions it holds. OpenCV contains implementations of more than 2500 algorithms! It is freely available for commercial also as academic purposes. And the joy doesn't end there! The library has interfaces for multiple languages, including Python, Java, and C++. The first OpenCV version, 1.0, was released in 2006 and therefore the OpenCV community has grown leaps and bounds since then. Now, the plethora of functions OpenCV offers! We will be watching OpenCV from the attitude of a knowledge scientist and learning about some functions that make the task of developing and understanding computer vision models easier.

V. ADVANTAGES:

- Predict the PUC detection predictions
- Effective prediction technique
- Secure and efficient system

VI. RESULT:

A] HOME PAGE:



B] LOGIN:



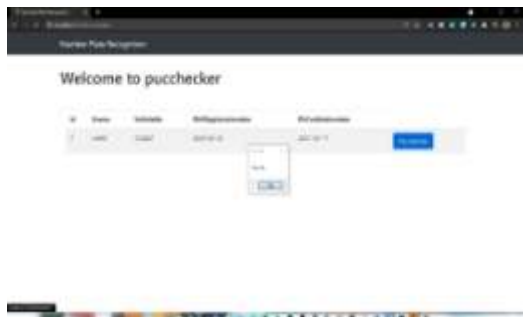
C] USER REGISTER:



D] EXTRACTED NUMBER PLATE:



E] VALIDATION IF PUC IS UPDATED OR NOT:



VII. FUTURE SCOPE:

Every vehicle will have its own PUC system in the near future, which will benefit both the owner and the pollution control department. A pollution-controlling wireless device can be developed with a variety of features. A system for detecting the proportion of various gases can be created.

VIII. CONCLUSIONS:

To control the capacitor voltages in a 7-level PUC three-phase inverter, this paper proposes the use of vector current control based on average capacitor voltage. The proposed technique is robust against load variation, parameter variation, and can detect variations in V_1 , according to simulation results. This device will continuously calculate the amount of pollutant CO emitted by the vehicle and submit a report to the RTO via GSM. The CO concentration will be verified by the RTO, and the PUC certificate will be granted.

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