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TRIPLE'S, HELMET, NUMBER PLATE DESIGN ON REALTIME INFORMATION SYSTEM

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***Abstract*— in this paper, we proposed a thought that it will screen the ongoing following of vehicle number plate, cap and triple riders by presents a state of the art Triple Protective cap Number Plate Framework, upsetting the observing of head protector consistence and number plates progressively. The research is in line with the 2019 Motor Amendment Act's enforcement of penalties for traffic violations, with a focus on addressing the rise in motorcycle-related fatalities in India.**

The framework utilizes three levels of profound getting the hang of, using YOLOV5 for constant picture grouping. Its main goal is to automate the detection of triple riding and fake number plates, giving law enforcement effective tools to keep the traffic safer and to maintain the law.

INTRODUCTION:

The Triple's, Helmet ,Number Plate Configuration on Constant Data Framework is reforming during the time spent in observing protective helmet, number plate plans by utilizing the most recent state of the art innovation. The application of cutting-edge technology aims to make it easier for law enforcement to quickly and effectively identify instances of triple riding as well as license plate fraud or tampering. This drive eventually advances a more secure and safer traffic climate. An ascent in motorbike and sulked related passing's has been credited to the hazardous propensity for driving without a protective cap in India. The Motor Amendment Act of 2019 included 63 new clauses to address this issue, including stiffer penalties for various traffic violations. In 2019, the Madras High Court in India orders that, the law should be applied in the same way as before and need to regulate properly.

As per the most recent report from the Indian government in 2022, roughly 1.5 lakhs of individuals lost their lives in street mishaps in 2021, addressing a 25% expansion in the passing rate. A considerable lot of these mishaps might have been forestalled by just

wearing protective caps and trying not to go in gatherings. Tragically, the ongoing framework depends on CCTV film to screen petty criminal offenses, which requires police officers to physically survey each casing and distinguish the violators. This cycle turns out to be significantly more dreary while zeroing in on the vehicle's tag to decide whether the rider is wearing a head protector. But what if there were a piece of technology that could automatically determine whether a motorcyclist was in violation of the law by not wearing a helmet and then compare that information to the database's record of the vehicle's registration number? Recent studies have already demonstrated the promise of this novel strategy.

This study aims to revolutionize the process of identifying traffic violators who don't wear helmets by developing a Non-Helmet Driver identification method. Leveraging the power of three tiers of Deep Learning, this method utilizes cutting-edge "YOLOV5" software to accurately classify individual motor bikes, headgear, and license plates in real-time. By incorporating OCR (Optical Character Recognition), the license plate number can then be retrieved. It should be noted that each of these methods is executed with specific parameters and limits in place. With the use of input in the form of moving images, the speed of processing is a crucial factor in the success of this method.

The upcoming sections on this paper will be structured as follows: In Section II, the framework proposed will be outlined. Section III will delve into the experimental results obtained. Lastly, Section IV will provide about the concluding remarks of this paper.

ABBREVIATIONS:

HAAR - Equipment as a Rental.

HOG - Hoard Histogram of Situated Inclinations.

LBP -Local Binary Pattern.

R-CNN -District Based Convolutional Brain Organization.

CNN - Convolutional Brain Organization.

OCR - Optical Person Acknowledgment.

CCTV -Shut Circuit TV.

RNN - Intermittent Brain Organizations.

PROPOSED SYSTEM:

The proposed Triple's Head protector, Number Plate Plan An ongoing data framework uses a blend of machine vision, information base administration, and correspondence innovations. Through cameras installed at various checkpoints, it continuously monitors triples, helmet, and number plates. The framework contrasts the caught number plate plan and a unified information base of approved plans. On the off chance that a confound or anomaly is identified then an alarm is shipped off policing continuously for additional activity. Below is a block diagram of the proposed system.

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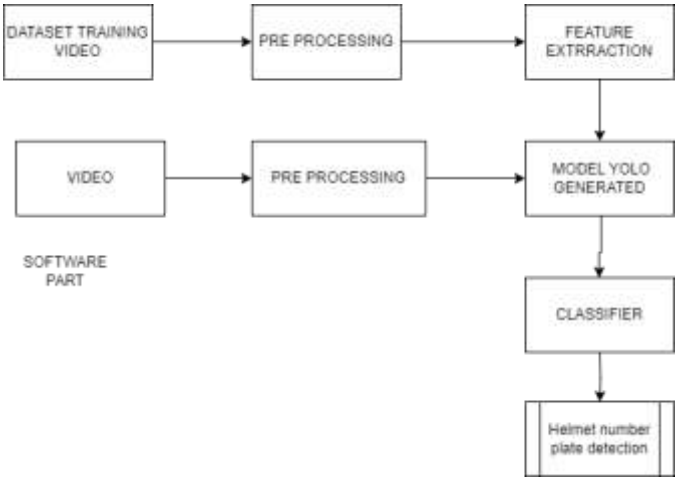

MODELS IMPLEMENTED:

PICTURE HANDLING MODEL:

When it comes to analysing and improving photos taken by cameras, image processing algorithms are of the utmost importance. These calculations are answerable for errands like picture ID, distinguishing objects, and extricating qualities to perceive cap tags.

MACHINE VISION MODEL:

One useful asset in picture examination is machine vision models, which can successfully translate the presence of protective cap number plates. State of the art innovations like Convolutional Brain Organizations (CNNs) and other profound learning models can be used to recognize and decipher different examples and plans engraved on the number plates. .

DATABASE DESIGN:

A brought together data set stores approved head protector number plate plans. This data set fills in as a kind of perspective for contrasting the caught number plate pictures and guaranteeing their realness.

DESIGN ACKNOWLEDGMENT MODEL:

Design acknowledgment models are utilized to look at the plan on the protective cap number plate with the plans put away in the data set. These models utilize different matching calculations to decide whether there is a match or a deviation.

MODEL OF COMMUNICATION:

The transmission of information in real time is made easier by this component. It empowers the framework to send cautions and notices to policing or important specialists when a fake or modified number plate is distinguished.

AI MODEL:

Machine learning models may be incorporated into advanced systems to adapt to evolving helmet number plate designs over time. The database is continuously updated and learned by these models.

MODEL OF LOCALIZATION:

A localization model can be used to determine the geographical origin of helmet number plates that are unique to particular countries or regions.

MODEL IN THE CLOUD:

The database may be stored and managed by the system using cloud-based services, making it accessible from various checkpoints and allowing remote updates.

ALTERING IDENTIFICATION MODEL:

To guarantee the respectability of the framework, altering location models can be utilized to distinguish any unapproved endeavours to control the caught pictures or the actual framework. These models and parts cooperate to make a vigorous and productive constant cap number plate configuration observing framework.

The selection of models and advances can fluctuate in light of framework prerequisites and the degree of complexity wanted for the application.

ADVANCED PICTURE HANDLING INCLUDES A FEW MAJOR ADVANCES:

The utilization of PC innovation for controlling pictures, otherwise called computerized picture handling, is a quickly developing field that has caught mankind's interest with visual boosts. While its set of experiences is somewhat concise, this innovation has demonstrated helpful for different kinds of pictures, however its adequacy might shift. Because of the emotional allure of visual showcases, it has collected critical consideration from the two researchers and the overall population. Notwithstanding, likewise with other famous fields, advanced picture handling is tormented by fantasies, misconnections, misconceptions, and deception.

This field resembles a tremendous umbrella that covers a different exhibit of themes, including optics, hardware, math, and photography, designs, and PC innovation. It really incorporates various teaches and is loaded up with muddled language Digital image processing has a bright future, according to several indicators. The decreasing cost of computer hardware is an important factor. Besides, various arising patterns in innovation, for example, the capacity to handle pictures at the same time because of additional reasonable chip, the reception of charge-coupled gadgets (CCDs) for digitization, stockpiling and show during handling, and the wide accessibility of minimal expense picture capacity exhibits are set to improve computerized picture handling abilities significantly further.

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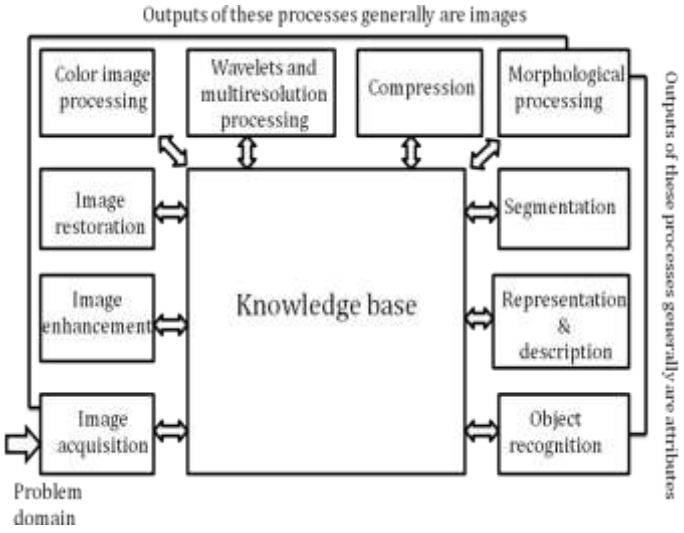

PICTURE COMPRESSION:

The primary objective of digital image compression is to eliminate redundant data in order to reduce the amount of data required to display a digital image. This includes changing over a 2D framework of pixels into a numerically uncorrelated dataset. Estimating information overt repetitiveness, a quantifiable idea, in numerical terms is doable. By doling out n1 and n2 to the quantity of data conveying units in two datasets passing on similar data, we can precisely decide the relative information overt repetitiveness of the first dataset addressed by n1. [2]

$$R_D = 1 - \frac{1}{C_R}$$

Known as the pressure proportion [2], it fills in as an estimation for how much an item's size is decreased.

$$C_R = \frac{n1}{n2}$$

A CUTTING-EDGE IMAGE COMPRESSION MODEL:

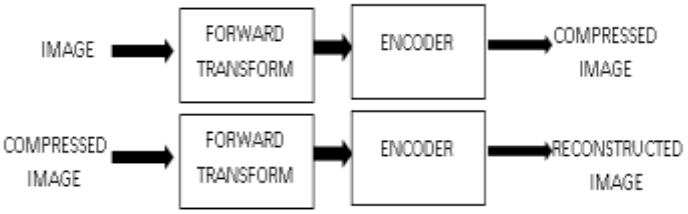

IMAGE COMPRESSION TYPES:

Explore the world of image compression with these two techniques:

- Image lossy compression and
- Lossless.

Both methods offer unique ways to reduce file size without compromising quality. See which one best suits your needs.

COMPRESSION RATI B0

COMPRESSION RATI $\frac{B1}{}$

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B0: Amount of pieces before - compression

B1: The number of bits after compression

IMAGE LOSSY COMPRESSION:

Lossy pressure altogether decreases information yet brings about error of the first picture. A high compression ratio is provided by it. Lossy picture pressure is valuable in applications, for example, broadcast TV, video conferencing, and design transmission, where a specific measure of blunder is an OK compromise to further develop pressure execution specifically, PGF is intended to decipher lossy packed elevated pictures rapidly and consecutively. A misfortune concealment approach is liked, as in applications like ground assessors, surface information (e.g., flying ortho-pictures) are frequently concentrated and sifted so they are envisioned as misfortune at the surface.

We investigate the effect of the PGF's diminished compression efficiency in the subsequent series of experiments. JPEG 2000 stands out as one of the best competitors in this particular category, without a doubt. Since JPEG 2000 has two different filters, we recommend the one that offers the best compromise between compression efficiency and runtime. On our machine, a 5/3 channel set is a preferable compromise over anything more. However, despite having extremely slow encoding and decoding speeds, JPEG 2000 is a major rival in the field of image file formats. Despite having extremely high compression ratios, JPEG 2000 is extremely efficient in compression. JPEG, which is widely used, is one of the first choices among users.

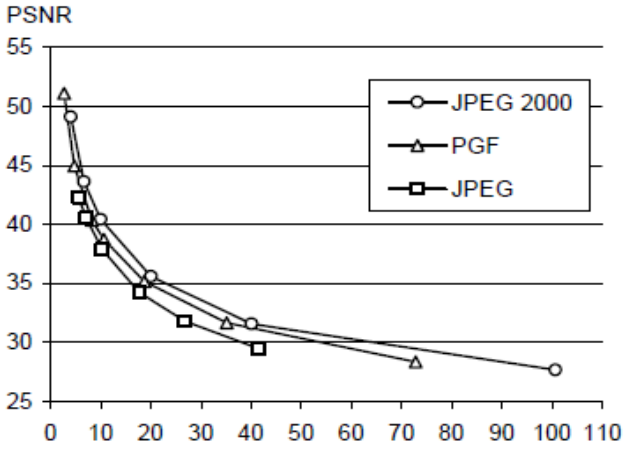

Fig: 1 PSNR of lossy pressure concerning pressure proportion

It is exceptionally quick and has a sensibly decent pressure effectiveness for an extensive variety of pressure proportions. The inconvenience of JPEG is that it needs lossless pressure and for the most part needs moderate disentangling. Figure 4 In this review we researched the normal rate mutilation conduct of pictures in Kodak test set exposed to fixed (non-moderate) lossy pressure procedures Kodak test set is famous in picture handling field as standard benchmark utilized measure the presentation of various pressure calculations Execution The typical PGF PSNR is 3% lower than the PSNR of JPEG 2000, however 3% better than JPEG.

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These outcomes are additionally subjectively substantial for our PGF test set and are trademark for aeronautical Orth-photograph regular pictures. Since PGF is planned, we definitely realize that PGF can't accomplish the pressure effectiveness of JPEG 2000. Be that as it may, we are keen on the exchange between pressure effectiveness and runtime To represent this compromise, we show an examination between JPEG 2000 and PGF in Table 4 and Fig. 1 We show the comparing disentangling times comparative with the pressure proportion for a similar test successions as in Fig.1.

downloading a compacted PGF is as yet five to multiple times quicker than delivering a JPEG 2000 record. Maybe progressively calculation.

	JPEG 2000 5/3			PGF		
Ratio	enc	dec	PSNR	enc	dec	PSNR
2.7	1.86	1.35	64.07	0.34	0.27	51.10
4.8	1.75	1.14	47.08	0.27	0.21	44.95
8.3	1.68	1.02	41.98	0.22	0.18	40.39
10.7	1.68	0.98	39.95	0.14	0.13	38.73
18.7	1.61	0.92	36.05	0.12	0.11	35.18
35.1	1.57	0.87	32.26	0.10	0.09	31.67
72.9	1.54	0.85	28.86	0.08	0.08	28.37

Table:-1 Compromise among quality and speed of Kodak tests

Table 1 incorporates the comparing encoding and disentangling seasons of the typical PSNR values for seven distinct pressure proportions (normal qualities over the pressure proportions of the eight pictures of the encoder test set). The explanation is that the genuine encoding stage (cf. Subsection 2.4.2) takes less time than the comparing disentangling stage. In six of the seven reproductions, the PSNR distinction between JPEG 2000 and PGF is inside 3% of the PSNR of JPEG 2000. Just in the principal classification is the distinction critical (21%), but since a PSNR of 50 compares to practically consummate picture the quality enormous PSNR contrasts frequently relate to contrasts not distinguished outwardly . . . . The cost paid in JPEG 2000 for a PSNR of over 3% is excessively high. Making a PGF is five to multiple times quicker than making a comparing JPEG 2000 document, and

In Figure 2 we see that for PSNR 3% higher than JPEG, the cost we pay in PGF is little: for little pressure proportions (< 9), disentangling in PGF accepts two times the length JPEG and pressure proportions high (> 30). It just requires 10% more investment than JPEG. These exploratory outcomes are normal for both regular pictures and aeronautical ortho pictures. Stage III of the investigation depended exclusively on the 'Lena' model. This choice was made to keep up with consistency and to prohibit the impacts of changes in working methodology. By utilizing just the 'Lena' picture, the specialists intended to limit outside factors that could frustrate the outcomes. This approach permitted more thoughtfulness regarding the presentation and viability of the tried calculations. We utilize six distinct quantization boundaries for our lossy coder and measure the PSNR with regards to the subsequent

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pressure proportions.

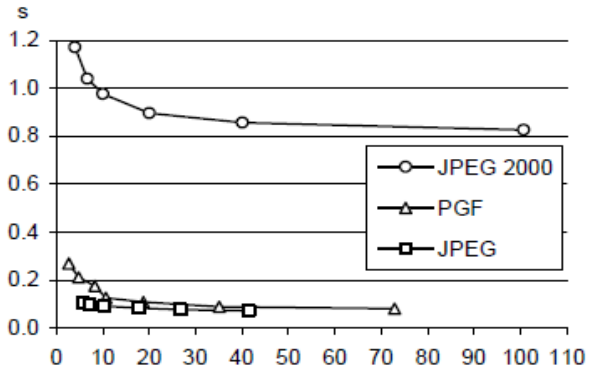

Figure:-2 disentangling time concerning pressure proportion

	WinZip	JPEG-LS	JPEG 2000	PNG	PGF
aerial	1.352	2.073	2.383	1.944	2.314
compound	12.451	6.802	6.068	13.292	4.885
hibiscus	1.816	2.200	2.822	2.087	2.538
houses	1.241	1.518	2.155	1.500	1.965
logo	47.128	16.280	12.959	50.676	10.302
redbrush	2.433	4.041	4.494	3.564	3.931
woman	1.577	1.920	2.564	1.858	2.556
average	**9.71**	**4.98**	**4.78**	**10.70**	**4.07**

Table:2 The PGF test set yielded a scope of lossless pressure proportions

LOSSLESS IMAGE INPUT:

Lossless picture pressure is the main satisfactory measure of information decrease. It gives lower pressure proportion contrasted with that with misfortune. Lossless picture pressure comprises of two totally autonomous cycles: (1) reimaging of the picture with decrease of its between pixel overt repetitiveness and (2) coding of the portrayal to eliminate coding overt repetitiveness from that point

Lossless imaging is valuable in applications like clinical imaging, proficient documentation, and satellite imaging. Table 2 shows the effectiveness of the lossless pressure, while Table 3 shows the drawn out recording of the PGF test set. For WinZip, just normal runtime information is given because of the inaccessibility of the source code, requiring a network agenda estimated by manual runtime and estimating any remaining qualities in cluster mode.

Table 2 shows the transcendence of JPEG 2000 in achieving the best pressure extent among any leftover pressure methodologies, including PGF, JPEG-LS, and PNG. These results contrast from those point by point in [SEA+00], which ensured that JPEG-LS achieved ideal execution for a relative test dataset. Our revelations, on the other hand, suggest that PGF shows a decreasing in show going from 0.5% (for pictures containing women) to 21.3% (for pictures containing logos) appeared differently in relation to JPEG 2000. All around, this differentiation is for all intents and purposes 15%. The vitally extraordinary cases for this model are the photos with a 'compound' or 'logo' them The photos on a very basic level feature dull text on a white establishment. In such cases, JPEG-LS, especially as WinZip and PNG, offers on a very basic level higher pressure rates.

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Considering the investigation aggregated by [SEA+00], clearly PNG is the top performing pressure plan all around. This suggests that, with respect to lossless pressure, PGF has exhibited to find lasting success for customary and aeronautical pictures. Nevertheless, in characterizations, for instance, 'compound' and 'logo,' PNG outmanoeuvres PGF predominantly.

	WinZip		JPEG-LS		JPEG 2000		PNG		PGF	
	enc	dec	enc	dec	enc	dec	enc	dec	enc	dec
a			1.11	0.80	5.31	4.87	3.70	0.19	0.99	0.77
c			1.61	0.38	3.46	3.06	2.95	0.18	0.95	0.80
hi			0.69	0.30	1.45	1.29	1.77	0.10	0.35	0.27
ho			0.65	0.30	1.62	1.47	0.85	0.11	0.41	0.32
l			0.09	0.02	0.26	0.21	0.16	0.01	0.07	0.06
r			0.65	0.44	4.29	4.01	3.61	0.16	0.66	0.59
w			0.39	0.30	1.76	1.63	1.08	0.08	0.35	0.27
av	1.14	0.37	0.74	0.36	2.59	2.36	2.02	0.12	0.54	0.44

Table:3 Runtime of lossless pressure of the PGF test set

The outcomes in Table 3 uncover the encoding (enc) and disentangling (dec) lengths, estimated in a moment or two, for similar calculations and pictures as introduced in Table 2. Using symmetric calculations, both JPEG 2000 and PGF display comparative velocities, while the hilter kilter calculations WinZip, JPEG-LS, and outstandingly PNG, exhibit a remarkable disparity in disentangling and encoding times. Outstandingly, JPEG 2000, taking the longest for both encoding and disentangling, expects more than four times the length of PGF. The facilitated speed of PGF can be credited to its productive coding process. Contrasting intently, JPEG-LS marginally lingers behind PGF in encoding time, be that as it may, remunerates with speedy picture disentangling time. Then again, WinZip and PNG outperform JPEG-LS in disentangling speed, yet their encoding times miss the mark. Consequently, PGF presents as a positive split the difference among encoding and disentangling rates.

Our investigation utilizing the PGF test set gives unquestionable proof that lossless PGF is the ideal decision for regular pictures and aeronautical ortho-photographs. Among all calculations, PGF stands apart for its capacity to encode three megabytes of elevated ortho-photographs in under a moment, without settling for less on pressure effectiveness. Our investigation uncovers that PGF accomplishes an effectiveness loss of under three percent, outperforming other driving procedures. This end is additionally affirmed by our assessment of the Kodak test set.

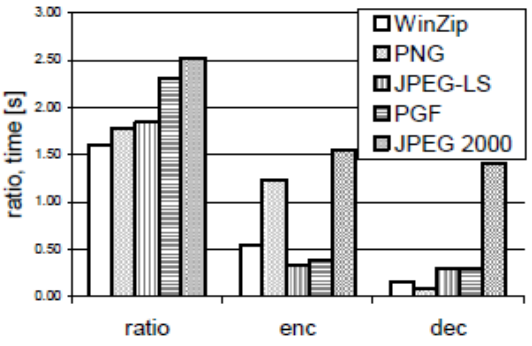

Fig-3 lossless pressure consequences of the Kodak test set.

The outcomes displayed in Figure 4 uncover the typical pressure proportions, encoding lengths, and disentangling terms for every one of the eight pictures. Among the pressure procedures assessed in the test set, JPEG 2000 ended up being the most proficient. Following firmly were PGF, JPEG-LS, PNG, and WinZip, positioned in plummeting request. Outstandingly, PGF displayed a less ideal execution with a marginally second rate consequence of eight percent contrasted with JPEG 2000. This result lines up with the way that JPEG 2000 is known for its predominant lossless pressure capacities. This can be credited to its attention on safeguarding picture quality, separating it from PGF's methodology.

Curiously, PGF outflanks both JPEG-LS and PNG overwhelmingly of 21% and 23%, individually, with regards to regular pictures. Moreover, in the Kodak test set, JPEG-LS shows a comparative example of encoding and disentangling times as PGF. While PNG and WinZip might have a quicker disentangling time than PGF, their encoding times are longer than Pgf's.

While assessing the significance of pressure effectiveness and runtime, PGF obviously stands apart as the better choice when thought about than different calculations for lossless pressure of regular pictures and aeronautical ortho-photographs. This was additionally affirmed in our third test, where we effectively applied our lossless coding calculation to the 'Lena' picture.

To carefully deal with a picture, the principal significant undertaking is to change over it into a mathematical configuration reasonable for PC control. These mathematical portrayals, otherwise called pixels, precisely mirror the brilliance levels of the picture at explicit places

Computerized pictures are an indispensable piece of our cutting edge world. With a normal of 250,000 pixels, these pictures ordinarily measure 512x512, albeit bigger pictures are turning out to be more normal. Once carefully caught, PCs can perform three fundamental undertakings on the picture. Point activities dole out yield pixel values dependent straightforwardly upon input pixel values. Nearby activities, then again, investigate different adjoining pixels to decide the result esteem. At long last, in worldwide tasks, every pixel from the information picture assumes a part in characterizing the comparing pixel in the result picture

In quest for ideal execution, these combinations try to figure out some kind of harmony: embracing versatility to oblige variety inside a class, while keeping up with sufficient peculiarity to endure the impact of diverting foundations and comparative classes. A significant part of our shape based acknowledgment methodology is its flexibility in coordinating strengthening picture information. This form based approach is additionally strengthened through the imaginative execution of a half and half acknowledgment technique, consolidating the qualities of both shape tokens and Filter highlights as

acknowledgment markers. By using the one of a kind qualities of each, shape tokens catch exact limits while Filter highlights extricate inadequate, yet critical picture patches. In this methodology, the learned mixes can comprise of one or the other 1) shape-tokens solely, 2) Filter includes solely, or 3) a mix of both shape-tokens and Filter highlights. These blends not entirely set in stone from preparing pictures and envelop the most distinctive highlights from the dataset. This consolidation of two degrees of variety, concerning both the number and sorts of highlights, furnishes the blends with upgraded flexibility and discriminative power. See [9] for a consolidated rendition of this paper.

EXPERIMENTAL RESULTS:

LIMITATIONS:

From the beginning, profound advancing frequently requires a lot of marked information. This inclination constrains vision specialists to zero in on effectively annotatable undertakings as opposed to focusing on those that hold the most significance. While there are strategies pointed toward diminishing the requirement for guidance, for example, move learning, they have not yet accomplished a similar degree of progress as regulated learning. Moreover, albeit profound brain networks succeed on normalized datasets, they might battle when given certifiable pictures that were not piece of the preparation information. It is essential to take note of that each dataset has intrinsic predispositions, which were particularly evident in before vision datasets. Specialists before long found ways of taking advantage of these predispositions, utilizing foundation setting to distinguish specific articles without any problem. Notwithstanding progressing endeavors to resolve these issues through broad datasets and high level organizations, predispositions keep on existing. Take, for instance, a profound organization that has been prepared on ImageNet to distinguish couches. When confronted with points of view that were not all around addressed in its preparation information, as displayed in Figure 2, this organization might experience challenges in precisely distinguishing couches. This is frequently in light of the fact that profound organizations exhibit a predisposition towards ordinarily happening occasions in datasets, while battling with "uncommon occasions" that are rarely portrayed. This postures critical difficulties in certifiable applications, especially when blunders in vision frameworks could

have serious repercussions. A decent representation of this is the way that datasets used to prepare independent vehicles seldom remember situations where children are sitting for the street (as displayed in Figure 2 from the source). Using Unbelievable CV, vision specialists are enabled with the capacity to easily control manufactured scenes - like modifying the point of view of a couch. Our discoveries uncovered that the normal accuracy (ap) of quicker R-CNN couch identification goes from 0.1 to 1.0, demonstrating a high aversion to perspective changes. This might actually be credited to predispositions in the preparation information that make quicker R-CNN favor specific perspectives.

One critical issue with profound brain networks is their weakness to picture modifications that a human wouldn't botch. These organizations have been found to answer unequivocally to even unpretentious antagonistic assaults, which bring about intangible changes to the picture. Moreover, they additionally display unreasonable aversion to context oriented adjustments. For instance, in Figure 3, we can perceive how embedding a guitar into a picture of a monkey in a wilderness can make the organization misclassify the monkey as a human and erroneously decipher the guitar as a bird. This is in all likelihood because of the uncommonness of monkeys conveying guitars contrasted with people and the high likelihood of birds being available in a wilderness climate close by monkeys..

Ongoing examinations have given endless models featuring the weakness of profound brain organizations to setting, like the situation of an elephant in a room. As profound organizations are confronted with impediments, they are inclined to mistakes and breakdowns. Such a peculiarity can be seen in three distinct situations: In the left, a motorbike impedes and supernaturally changes a monkey into a human; in the middle, a bike blocks and incredibly changes a monkey into a human, while likewise changing the bike handle into a bird as a component of the wilderness; and morally justified, a guitar impedes and incredibly transforms the monkey into a human, while additionally transforming the guitar into a bird inside the wilderness. As a result of the restricted measure of information accessible, brain networks have an increased consciousness of setting. This is because of the way that the datasets just incorporate a limited number of context oriented circumstances for each item, prompting a predisposition towards those particular settings. For instance, early picture subtitling datasets showed that giraffes were much of the time just seen close to trees. Subsequently, when given pictures without trees, the produced inscriptions would disregard the presence of the giraffes, despite the fact that they were the fundamental concentration.

The most common way of incorporating the large number of settings and moderating an overflow of disturbance factors presents a significant obstruction for information driven strategies like profound brain

organizations. It appears to be that conquering these obstructions might require critical datasets, adding huge difficulties for both the preparation and testing stages. These particular difficulties will be dove into additional in the accompanying conversation.

CONCLUSION:

The Triple Helmet Number Plate Design Real-time Information System is a significant step toward addressing the issue of counterfeit helmet number plates. By providing real-time monitoring and alerts, this system enhances traffic safety and assists law enforcement agencies in their efforts to maintain road order. It is essential to consider the advantages and disadvantages while implementing the system to strike a balance between security and privacy concerns.

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