e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:02/February-2023 Impact Factor- 7.868 www.irjmets.com

FAKE LOGO DETECTION WITH IMAGE PROCESSING

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ABSTRACT

With the adding frequency of online fraud and the use of fake ensigns to deceive consumers, there's a need for effective styles to descry and help the use of fake ensigns on the internet. In this paper, we propose a system for detecting fake ensigns using image processing ways. Our approach involves rooting features from the ensigns and training a classifier to distinguish between real and fake ensigns. We estimate the performance of our system on a dataset of real and fake ensigns and demonstrate its effectiveness in detecting fake ensigns with high delicacy. Every day, hundreds of sphere names, websites and ensigns are being reproduced by cyber culprits who want to gain your trust so they can steal your data. It's getting a big issue in the online world and needs to be addressed. This composition will bandy the original design background of our new Fake totem Discovery System.

Keywords: YOLO Algorithm, Logo Detection, Darknet, Deep Learning, Machine Learning, Object Detection, Opencv.

I. INTRODUCTION

Every time, brands lose a significant portion of their deals to unauthorized knock off brands and fakes. Also, since similar fake products are generally of an inferior quality, they also end up damaging the credibility of the brand. Numerous a time's consumers also get cheated out of their hard- earned plutocrat as they end up shelling out an extravagant quantum of plutocrat for a bare fake. This totem Discovery app aims to help consumers distinguish phonies from the original product. Using this system, a consumer can corroborate whether a product is in fact an original. This operation can also be helpful for brands floundering to fight against forged products. Fake products generally have an inferior erected quality and along with stealing deals, they also damaging a brand's character in the long run. Along with harming a brand's deals and character, ignorant consumers also get cheated out of their plutocrat. This totem Discovery design aims to help druggies identify phonies by assaying the totem on the product. Along with helping druggies identify the totem, this app also helps brands combat totem pirating. This design is developed using the Django frame with Python as programming language.

The Expanding and massive product of visual data from companies and institutions, and the decreasingly fashionability of social system. Graphics ensigns are special class of visual objects extremely important to pierce the identity of commodity or someone. ensigns are graphic products that either recall some real world objects, or emphasize a name, or simply display some abstract signs that have strong perceptual appeal. utmost of the exploration related to trademark recognition deals with the problem of content grounded indexing and reclamation in totem databases, with the thing of aiding the process of trademark enrollment . In this case the image accession and processing chain is controlled so that the images are of respectable quality and aren't distorted. A general system for totem discovery and recognition in images taken in real world surroundings must misbehave with differing conditions. On the one hand, invariance to a large range of geometric and photometric metamorphoses is needed to misbehave with all the possible conditions of image/ videotape recording. Since in real world images ensigns aren't captured in insulation, totem discovery and recognition should also be robust to partial occlusions. At the same time, especially if we want to discover vicious tampering or recoup ensigns with some original tricks, we must also bear that the small differences in the original structures are captured in the original descriptor and are sufficiently distinguishing for recognition.

II. METHODOLOGY

All the ensigns in the world can be set up far and wide. They're used to represent everything from apparel brands to coffee shops, from companies to politicians. And further than anything differently, people want their totem identity honored on the digital web. But there's a retired side of these totem images that you could no

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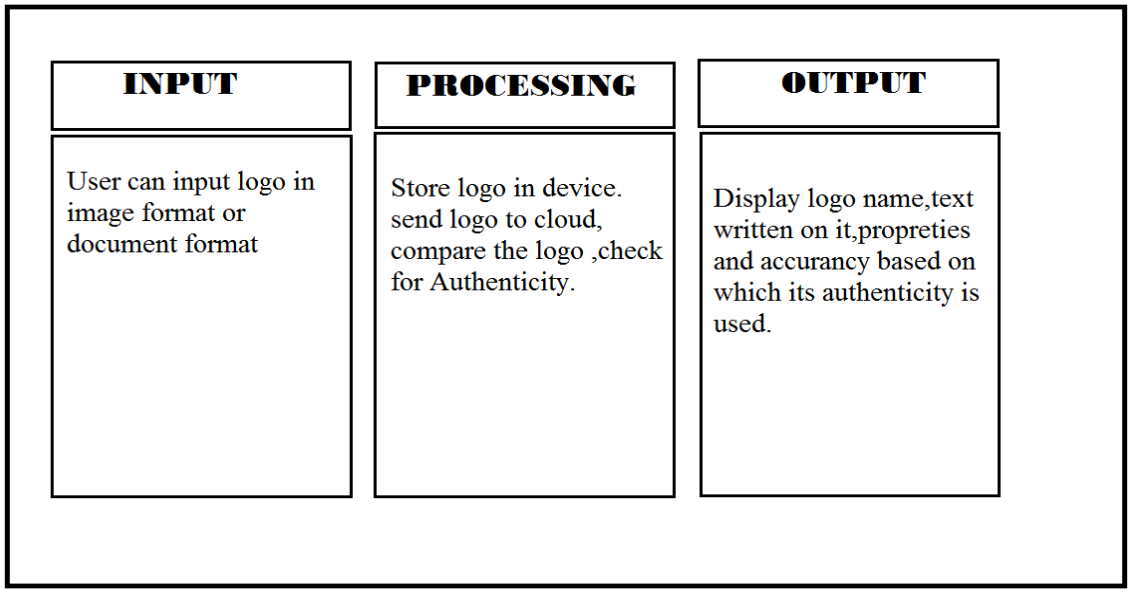
way preliminarily have seen they might also be relatively delicate to spot online! As computer- backed contrivers move towards decreasingly complex and less- scannable designs that repel easy reduplication by machine, it becomes important for experimenters to find innovative ways logotypes can be linked online using qualitative styles or algorithms. And this is where experimenters are chancing that effects are changing.

Overall, this system uses a combination of machine literacy and image processing ways to dissect the features of ensigns and make opinions about their authenticity. By continually streamlining and enriching the machine literacy model and the database of licit ensigns, the system can ameliorate its delicacy and effectiveness in detecting fake ensigns. The qualitative methodology of online totem discovery system measures each totem on a scale from 1- 5 and also calculates scores for each one. It can descry, compare and rank ensigns by comparing them with the loftiest scoring bones in their class. This is made possible because of the use of deep literacy fashion which has been used to learn and determine. the system itself will be set with thousands of input data to make the ' training ' session to be more effective and briskly so this will be bandied in the result of the paper. Machine literacy is also a frequent system that has been applied to image bracket. Thus, image bracket is going to be enthralled with a deep liter acysystem. Classification is easy for humans, but it has proved to be a major problem for machines. It consists of unidentified patterns compared to detecting an object as it should be classified into the proper orders.

- **Yolo Algorithm: (YOU ONLY LOOKS ONCES).**

Yolo algorithm is a state of art object detection algorithm and it is so fast that become a almost a standard way of detecting object in the field of computer vision, previously people where using sliding window object detection then more faster various where invented such as R CNN, fast R CNN faster R CNN, but in 2015, YOLO was invented which are performed all the previous object detection algorithm.



• How YOLO works YOLO algorithm workshop using the following three ways

1. Residual blocks

2. Bounding box retrogression

3. Crossroad Over Union (IOU)

1. Residual blocks First, the image is divided into colorful grids. Each grid has a dimension of S x S. The following image shows how an input image is divided into grids.

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In the image over, there are numerous grid cells of equal dimension. Every grid cell will descry objects that appear within them. For illustration, if an object center appears within a certain grid cell, also this cell will be responsible for detecting it.

2. Bounding box retrogression A bounding box is an figure that highlights an object in an image.

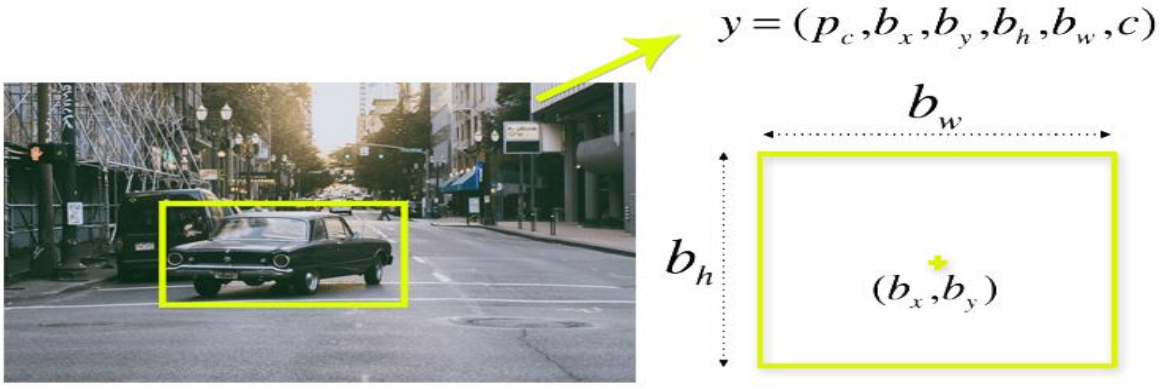
Every bounding box in the image consists of the following attributes.

• range (bw)

• Height (bh)

• Class (for illustration, person, auto, business light, etc.) This is represented by the letter.

• Bounding box center (bx, by) The following image shows an illustration of a bounding box. The bounding box has been represented by a unheroic figure.



YOLO uses a single bounding box retrogression to prognosticate the height, range, center, and class of objects. In the image over, represents the probability of an object appearing in the bounding box.

3. Crossroad over union(IOU)

Crossroad over union(IOU) is a miracle in object discovery that describes how boxes lap. YOLO uses IOU to give an affair box that surrounds the objectsperfectly.Each grid cell is responsible for prognosticating the bounding boxes and their confidence scores. The IOU is equal to 1 if the prognosticated bounding box is the same as the real box. This medium eliminates bounding boxes that aren't equal to the realbox.The following image provides a simple illustration of how IOU works.

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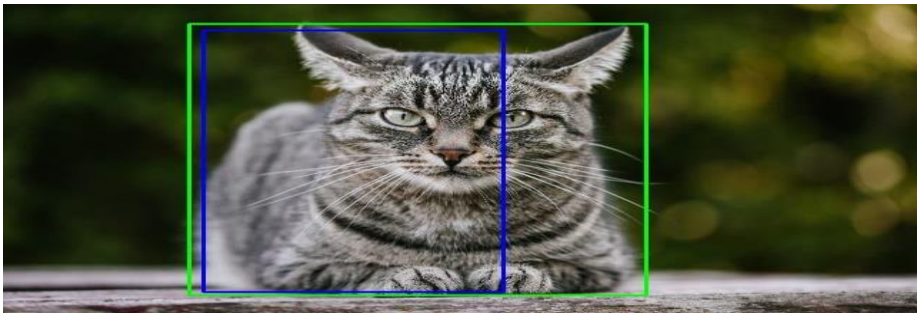

In the image over, there are two bounding boxes, one in green and the other bone in blue. The blue box is the prognosticated box while the green box is the real box. YOLO ensures that the two bounding boxes are equal.

III. FLOWCHART OF SYSTEM

Flowchart of system which are used is presented in this section.

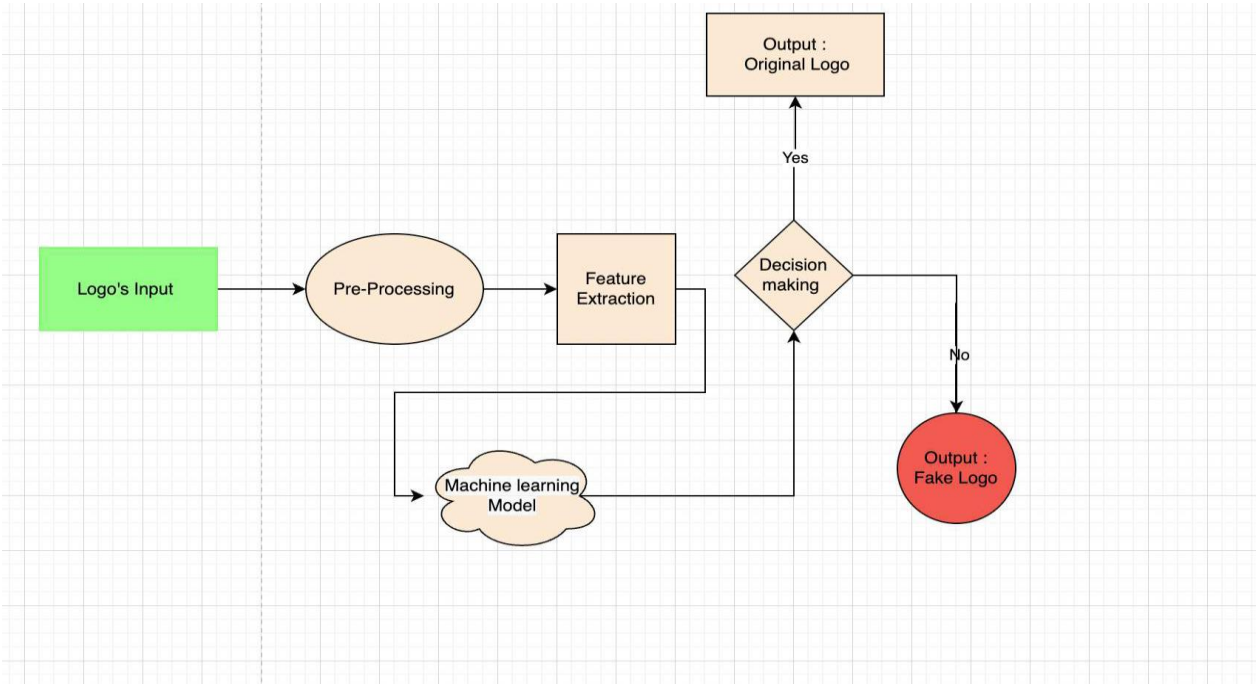

Figure 1: Flowchart of system.

This is a project that works on the detection of fake online logos. This system allows users to upload the image they want to verify whether it is legit. This system process the uploaded images by detecting various type of areas in it with unique algorithms and comparing its result with a database of information that was previously generated by this same system and reporting back to the user in multiple regions as well as pointing out what kind of errors are found on the images such as missing/wrong words/ edges, etc.

• **Logo Input:** This is the input module of the system, where logos are submitted for analysis. These logos may come from a variety of sources, such as websites, social media platforms, or e-commerce sites.

• **Preprocessing:** In this module, the logos are preprocessed and prepared for analysis. This may involve resizing the logos to a standard size, removing background noise or clutter, or performing other preprocessing steps to improve the quality of the logo for analysis.

• **Feature Extraction:** In this module, the system extracts relevant features from the logo that will be used for analysis. These features may include color, shape, typography, and other characteristics of the logo.

• **Machine Learning Model:** This is the core of the system, where a machine learning model is used to analyze the features of the logo and compare them to a database of known legitimate logos. The model is trained to recognize patterns in the features of the logo that are indicative of authenticity.

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• **Decision Making:** Based on the output of the machine learning model, the system makes a decision about the authenticity of the logo. If the logo is determined to be fake, it is flagged for further review or removed from the system.

• **Output:** The final output of the system is a decision about the authenticity of the logo, along with any relevant information or recommendations for further action. This output may be presented to a user or incorporated into other systems or processes.

IV. RESULTS AND DISCUSSION

It is a result of the logo detector using a darknet framework with 1.00 accuracy that means the system strongly confirms the logo of Nike in the tester image 100%. Although it is very accurate and precise, the device is quite difficult and inconvenient to use.

Fig. 2. Darknet output test.

Fig.3. OpenCV DNN output test with Python coding.

Fig 4

V. CONCLUSION

I was quite pleased with the results of my initial model and the web app's basic functioning. But it was only the top of the iceberg! Here are some potential future stages for this project that I've been considering:

Understanding how such a system may be successful while yet safeguarding people's privacy. To establish product/market fit, pitch use-cases to brands/marketers. Expand the product prototype and get feedback Allow bulk image processing over a Restful API. Integrate with Instagram's (and other social media picture

services') API to gather photographs automatically. Enhance and improve the model/process Improve recall on the "has logo" class by include class weights in the loss function, as proposed in this Stack Overflow article. Increase pictures by training it on additional data. Localization of logo detection (i.e., where, if any, is a logo in this image?) Combine existing textual analytics with logo detection. Model selection and hyper-parameter adjustment should be automated. Investigate various model designs. Contrast model performance with those of existing logo-detection systems.

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