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Review on Fake Face Detection System Using Machine Learning

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ABSTRACT: It is a fact that social media have changed the way people interact and carry on with their everyday lives. A machine learning feature was used to better predict fake accounts, based on their posts and the placement on their social networking walls. Many of the techniques of digital image processing, or digital picture processing as it often was called, were developed in the 1960s. The results showed that using this application on mobile platforms significantly reduces the spread of fake images across social networks. Digital image processing has many advantages over antilog image processing. It allows a much wider range of algorithms to be applied to the input data. Face recognition is one of the most famous biometric methods of identity authentication, which is widely used in the field of security of organizations and enterprises, safety in public places such as airport terminals, train stations, stadiums, outdoor surveillance.

KEYWORDS:- Machine Learning, Python, Fake Image Detection, Image Processing, New Trends

I. INTRODUCTION

It is a fact that social networks have changed the way People interact and go about their daily lives. social networks are now a prominent media phenomenon and have attracted large numbers of People. The number of users worldwide is now over three billion. in gulf Region has exceeded 66% growth in the number of active users. Saudi Arabia ranks seventh globally for social media use; more than 75% of him It is estimated that 25 million people are active users of social networks. Social networks are based on specific foundations that unite and empower people Express yourself, share your interests and ideas and make new friends with others who share your interests. Facebook, Twitter and Instagram are among the most popular social networking sites of the day. is a generalization Practice for sharing images online via social networking services such as Instagram. At least 80 million images are currently being shared on Instagram Day. Instagram allows users to take photos and apply digital photos Filter and upload the images to social media site along with short subtitles. Billions of images are uploaded and shared by people every day social networks. Many people have become victims of the photo Fake in this technological age. Some criminals use software to exploit and Use photos as evidence to confuse courts. To put an end to this All photos shared via social media must be marked as true or false. Social media is a great platform to share and spread knowledge. Yet If precautions are not taken, people can be deceived and even tricked into unintended actions. false propaganda. Although most image manipulations with Photoshop are self-evident, some of these images may appear real due to pixelation and poor quality. beginner jobs. Edited images can break, especially in the field of politics the credibility of a politician. In this research using machine learning Algorithms, the researcher will try to propose a classification model by a Convolutional Neural Network (CNN) that can benefit from it Knowledge to take an image from social networks and then classify and recognize it. This The research proposes an approach that takes an image as input and classifies it, with an effective system (the CNN model). The result of this proposed research It will be useful to monitor and track the content of social networks

Image Processing

Digital image processing is the use of a digital computer to process digital images through an algorithm. As a subcategory or field of digital signal processing, digital image processing has many advantages over analogue image processing. It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and distortion during processing. Since images are defined over two dimensions (perhaps more) digital image processing may be modelled in the form of multidimensional systems. The generation and development of digital image processing are mainly affected by three factors: first, the development of computers; second, the development of mathematics (especially the creation and improvement of discrete mathematics theory); third, the

and in Discover scams on social networking sites, especially in the area of Images.



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demand for a wide range of applications in environment, agriculture, military, industry and medical science has increased.

II. LITERATURE REVIEW

Very little discovery work has been done Audio, image and video spoofing. However, several studies and works are in progress to find out what can be done about the incredible spread of counterfeiting pictures on the internet. Adobe acknowledges the misuse of Photoshop and has tried to offer some kind of antidote. Below is a summary of some of them these studies:

According to a study by Zheng et al. (2018), Identifying fake news and images is very difficult, as is uncovering the facts Pure-based novelty remains an open question and several existing models could be used to fix the problem. An investigation has been proposed "Fake News Detection". Through a thorough investigation of fake news, many useful properties are determined by the words of the text and Photos used in fake news. There are several hidden features Words and images used in fake news marked with a collection of hidden properties derived from this model over several levels. A model called TI-CNN was proposed. Clear and integrated display operates in the unified space, TI-CNN consists of both text and images information at the same temperature 2018 architecture proposal to identify fake social media accounts networks, especially on Facebook. In this study, a machine learning function was used to better predict fake accounts based on their posts and Post on your social media message boards. It supports Vector Machine (SVM) and This process used Complement Naive Bayes (CNB) to validate the content based on text classification and data analysis. data analysis focused on a set of offensive words and their occurrence counts say it again For Facebook, SVM shows 97% resolution while CNB shows 95% healing. detect fake BOW accounts (Bag of Words). Results The study confirmed that the main problem is related to the security of social networking sites is that the data is not adequately checked before publication.

In 2017 A study by Bunk et al. proposes two systems for detecting and locating counterfeits Images with a combination of resampling properties and deep learning. in the initial the system by which the transformation of the resampling property of radon is determined Photo Overlay Fixes. Deep Learning and Gaussian Classifiers The conditional domain model is then used to create the heat map. Arbitrarily Walker's segmentation method uses the total area. On the following system, e.g. Identification and location are passed through the resampling properties of the software Patching overlapping objects in long-term memory (LSTM) based networks. in the detection/location performance of the two systems was also compared. The results confirmed that both systems are active in tracking and accounting digital image fraud.

The trained neural network has succeeded in identifying the image as fake or real, with a high success rate of 83%. The results showed that using this application on mobile platforms significantly reduces the spread of fake images across social networks. In addition, this can be used as a false image verification method in digital authentication, court evidence assessment, etc. It develops and tests reliable fake image detection program by combining the results of metadata analysis (40%) and neural network output (60%).

According to Kim's and Lee's, digital forensics techniques are needed to detect manipulation and fake images used for illegal purposes. Thus, the researchers in this study have been working on an algorithm to detect fake images through deep learning technology, which has achieved remarkable results in modern research. First, a converted neural network is applied to image processing. In addition, a high pass filter is used to get at hidden features in the image instead of semantic information in the image. For experiments, modified images are created using intermediate filter, Gaussian blurring, and added white Gaussian noise.

This research develops an approach that takes an image as input and classifies it, using the CNN model. For a completely new task/problem, CNNs are very good feature extractors. It extracts useful attributes from an already trained CNN with its trained weights by feeding your data at each level and tuning the CNN a bit for the specific task. This means that a CNN can be retrained for new recognition tasks, enabling to build on pre-existing networks. This is called pre-training, where one can avoid training a CNN from the beginning and save time. CNN can carry out automatic feature extraction for the given task. It eliminates the need for manual feature extraction, since the features are learned directly by the CNN. In terms of performance, CNNs outperform many methods for image recognition tasks and many other tasks where it gives a high accuracy and accurate result.

AdvantageFake Face Detection System

1. Easily identifies trends and patterns

Machine Learning can review large volumes of data and discover specific trends and patterns that would not be apparent to humans. For instance, for an e-commerce website like Amazon, it serves to understand the browsing



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behaviours and purchase histories of its users to help cater to the right products, deals, and reminders relevant to them. It uses the results to reveal relevant advertisements to them.

2. No human intervention needed (automation)

With ML, you don't need to babysit your project every step of the way. Since it means giving machines the ability to learn, it lets them make predictions and also improve the algorithms on their own. A common example of this is antivirus software's; they learn to filter new threats as they are recognized. ML is also good at recognizing spam.

3. Continuous Improvement

As ML algorithms gain experience, they keep improving in accuracy and efficiency. This lets them make better decisions. Say you need to make a weather forecast model. As the amount of data, you have keeps growing, your algorithms learn to make more accurate predictions faster.

4. Handling multi-dimensional and multi-variety data

Machine Learning algorithms are good at handling data that are multi-dimensional and multi-variety, and they can do this in dynamic or uncertain environments.

5. Wide Applications

You could be an e-tailer or a healthcare provider and make ML work for you. Where it does apply, it holds the capability to help deliver a much more personal experience to customers while also targeting the right customers.

DisadvantageFake Face Detection System

With all those advantages to its powerfulness and popularity, Machine Learning isn't perfect. The following factors serve to limit it:

1. Data Acquisition

Machine Learning requires massive data sets to train on, and these should be inclusive/unbiased, and of good quality. There can also be times where they must wait for new data to be generated.

2. Time and Resources

ML needs enough time to let the algorithms learn and develop enough to fulfil their purpose with a considerable amount of accuracy and relevancy. It also needs massive resources to function. This can mean additional requirements of computer power for you.

3. Interpretation of Results

Another major challenge is the ability to accurately interpret results generated by the algorithms. You must also carefully choose the algorithms for your purpose.

4. High error-susceptibility

Machine Learning is autonomous but highly susceptible to errors. Suppose you train an algorithm with data sets small enough to not be inclusive. You end up with biased predictions coming from a biased training set. This leads to irrelevant advertisements being displayed to customers.

Application Fake Face Detection System

1. Image Recognition:

Image recognition is one of the most common applications of machine learning. It is used to identify objects, persons, places, digital images, etc. The popular use case of image recognition and face detection is, Automatic friend tagging suggestion: Facebook provides us a feature of auto friend tagging suggestion. Whenever we upload a photo with our Facebook friends, then we automatically get a tagging suggestion with name, and the technology behind this is machine learning's face detection and recognition algorithm. It is based on the Facebook project named "Deep Face," which is responsible for face recognition and person identification in the picture.

2. Speech Recognition

While using Google, we get an option of "Search by voice," it comes under speech recognition, and it's a popular application of machine learning.



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3. Traffic prediction:

If we want to visit a new place, we take help of Google Maps, which shows us the correct path with the shortest route and predicts the traffic conditions. It predicts the traffic conditions such as whether traffic is cleared, slow-moving, or heavily congested with the help of two ways:

Real Time location of the vehicle form Google Map app and sensors.

Average time has taken on past days at the same time.

Everyone who is using Google Map is helping this app to make it better.

It takes information from the user and sends back to its database to improve the performance.

4. Product recommendations:

Machine learning is widely used by various e-commerce and entertainment companies such as Amazon, Netflix, etc., for product recommendation to the user. Whenever we search for some product on Amazon, then we started getting an advertisement for the same product while internet surfing on the same browser and this is because of machine learning. Google understands the user interest using various machine learning algorithms and suggests the product as per customer interest. Advertisement As similar, when we use Netflix, we find some recommendations for entertainment series, movies, etc., and this is also done with the help of machine learning.

5. Self-driving cars:

One of the most exciting applications of machine learning is self-driving cars. Machine learning plays a significant role in self-driving cars. Tesla, the most popular car manufacturing company is working on self-driving car. It is using unsupervised learning method to train the car models to detect people and objects while driving.

6. Email Spam and Malware Filtering:

Whenever we receive a new email, it is filtered automatically as important, normal, and spam. We always receive an important mail in our inbox with the important symbol and spam emails in our spam box, and the technology behind this is Machine learning. Below are some spam filters used by Gmail:

7. Virtual Personal Assistant:

We have various virtual personal assistants such as Google assistant, Alexa, Cortana, Siri. As the name suggests, they help us in finding the information using our voice instruction. These assistants can help us in various ways just by our voice instructions such as Play music, call someone, open an email, Scheduling an appointment, etc.



III. DESIGN & IMPLEMENTATIONS



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IV. RESULTS & DISCUSSION

V. CONCLUSION

In the 21st century, the majority of the tasks are done online. Newspapers that were earlier preferred as hard-copies are now being substituted by applications like Facebook, Twitter, and news articles to be read online. WhatsApp's forwards are also a major source. The growing problem of fake news only makes things more complicated and tries to change or hamper the opinion and attitude of people towards use of digital technology. When a person is deceived by the real news two possible things happen- People start believing that their perceptions about a particular topic are true as assumed. Thus, in order to curb the phenomenon, we have developed our Fake news Detection system that takes input from the user and classify it to be true or fake. To implement this, various NLP and Machine Learning Techniques have to be used.

The neural network is successfully trained using error level analysis with 4000 fake and 4000 real images. The trained neural network was able to detect the image as unrealistic or realistic with a maximum success rate of 83%. Using, this application on mobile platforms as a means of false evidence in digital verification, court evidence testing etc. By combining the results of metadata analysis (40%) and neural network output (60%) A reliable image detection system is developed and tested.

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