Detection of Malicious Applications using YOLO V3-Spatial Pyramid Pooling over Optical Character Recognition for Computing Access Time

Gowtham V. and Devi T.
Saveetha University, India

Keywords: Android Application, Deep Learning, Novel You Only Look Once V3-Spatial Pyramid Pooling, Internet Access, National Security, Optical Character Recognition Algorithm, Text Detection, Vulnerability Detection.

Abstract: The goal of research is to use the Novel YOLO V3 SPP for detecting malicious applications while comparing it with the OCR technique for computation of access time. Materials and Methods: The Innovative YOLO V3 SPP algorithm is used to determine access time using a sample size of (N=25), a total sample size of (N=50), and G power is computed to be 80%. In terms of data exploitation prediction, the Novel YOLO V3 SPP has an access time that is slower (83.36ms) than the OCR algorithm's (79.64ms). According to the results, there is no statistically significant difference between the Novel YOLO V3 SPP Algorithm and the OCR Algorithm with p=0.218 (independent sample t-test p<0.05). In comparison to OCR's access time of 79.64ms, the novel YOLO V3 SPP method predicts vulnerabilities in native programmes with a longer access time of 83.36ms.

1 INTRODUCTION

Deep learning is quickly developing their standards in text and object recognition all over the world (Zhang et al. 2022). It's basically working on neural networking and it's becoming easy to detect all the solutions to this project. Deep learning basically works under machine learning in all over internet access. It is used in most significant manner to find text in the surrounding images (Garcia-Argibay et al. 2022). It provides a basic ideology of finding perspective in images. Android applications are plagued by data exploitation everywhere in internet access. The model also needed to be in terms of accuracy (Bergler et al. 2022). As a result, it is used to collect data more rapidly on a significant scale. To eradicate data exploitation in native applications, Data leakage can be detected using deep learning, and it can be avoided using a variety of techniques.(El-Amir and Hamdy 2020)(James et al. 2017) (Sivakumar et al 2022). Speed and security will be through deep learning in android applications. In this way, the proposed research aim will be achieved (PirahanSiah 2019). Data cleansing, computer vision, customer relationship management, fraud detection, speech detection, and many other uses are all possible with deep learning.(Kim 2017).

This proposed work includes numerous research papers are published in IEEE, 5000 articles from Springer, 2400 articles from Science Director, and 4090 publications from Google Scholar on text detection and prediction of data leakage and it have more citations than 50 times (Amaratunga 2021). The best cited article is one where the OCR model is a powerful tool for detecting text in natural environments and has received significant attention in the research community, with 77 citations (Ketkar and Moolayil 2021). One of the key advantages of this model is its ability to accurately identify text at various positions and scales, providing insight into the importance of features for effective text detection. Overall, the OCR model has proven to be a valuable resource for researchers studying text detection in natural situations. The use of deep learning for text detection in natural environments has significantly Novel the capabilities of computer processing applications. This research has paved the way for a new era of deep learning and has reshaped the way we approach text detection in natural scenes. Overall, the advancements in this field have significantly the effectiveness of text detection using deep learning techniques (Kelleher 2019). This research focuses on extracting textual information from natural scenes, with a particular focus on android applications such

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as license plate recognition and navigation. The findings of this research have been highly influential, as evidenced by the 26 citations it has received (Kariya, Fujishima, and Zhang 2019). Overall, the goal of this research is to improve the ability to identify and extract relevant text from natural environments, with the potential to facilitate a range of practical applications and to provide national security in internet access (Brum et al. 2023).

Existing systems suffer from certain limitations such as lesser response time for accessing the data. (Patterson and Gibson 2017). Depending on the specific font or script used for the letter, the resulting matrix is labeled as representing a specific character. In order to overcome these pitfalls, the proposed algorithm Novel YOLO V3 SPP is used as an alternative to OCR algorithm which is basically to improve the access time. OCR is slower in predicting the textual materials in images. Also, it does not provide accurate prediction in small text values throughout the model (Mueller and Massaron 2019). It needs vast space to process the model in every aspect. The quality of image gets lost in processing the model for national security (Arif Wani et al. 2019) (G. Ramkuamr et al. 2021). It will not recognize the printed text only not as hand written text. The goal of research is to improve the access time using Novel YOLO V3 SPP comparison with OCR algorithm for predicting the vulnerability detection and to provide national security.

2 MATERIALS AND METHODS

The study was carried out in the data analysis lab at Saveetha School of Engineering, Saveetha Institute of Medical and Technological Sciences, which has a high configuration system for carrying out studies and obtaining results. Two groups were taken into account for the study, with a sample size of 25. (Nundy, Kakar, and Bhutta 2021). 80% of the G-power value, 0.05 alpha, 0.2 beta, and a 95% confidence range are used to calculate the result (Kane, Phar, and BCPS n.d.).

CVE (Common Vulnerability and Exposures), a dataset used in this suggested study, analyses programmes using predefined threats and vulnerabilities to generate the vulnerability ratings. You must use Kaggle to download CVE (Mell 2002). The dataset used in this analysis helps identify the vulnerability status. The data set is then subjected to the methodology devised in this study, and the outcomes are contrasted with the comparison algorithm (Brum et al. 2023). Based on the specified work, these data are logged using real-time apps and separated into several columns. CVE uses the internet to enhance national security and is based on a list of applications that can corrupt data.

In this research, the implementation is carried out using Jupyter notebook, an open-source web application that enables the creation and sharing of documents, including machine learning methods. The code for this research is saved in the Jupyter directory, and the system uses darknet-53 to analyze images in natural scenes. Jupyter notebook allows for the easy execution and organization of code, making it a useful tool for researchers and developers. Jupyter notebook is an open-source web application.

Novel You Only Look Once Algorithm V3 Spatial Pyramid Pooling Algorithm

Novel YOLO V3 SPP (You Only Look Once V3 Spatial Pyramid Pooling) algorithm is the sample preparation group 1 and the proposed algorithm for this proposed work. Novel YOLO v3 SPP is a real-time object detection algorithm that uses convolutional neural networks (CNNs) to identify objects in video. In version 3, the algorithm was longer to increase both speed and accuracy and to provide national security. It is designed to detect large sections of objects at a time, using comparison methods to quickly identify and classify data as it is received. The proposed research involves inputting an image and processing it through CNNs, including 24 convolution and max-pooling layers, followed by fully connected layers. To reduce the number of layers, convolution is used followed by layer convolution. The final layer of Novel YOLO V3 SPP predicts an output by generating from the fully connected layers and reshaping them to the size of the input image in usage of internet access. Overall, the goal of this research is to improve the speed and accuracy of object detection, while maintaining a high level of efficiency to increase national security in internet access. Table 1 procedure refers to the procedure of the Novel YOLO V3 SPP algorithm.

Optical Character Recognition Algorithm

Optical character recognition (OCR) is sample preparation group 2 and is a process and technology that converts text and images containing text into a digital format that can be read by a computer. OCR algorithms work by dividing an image of a text character into smaller sections and analyzing the presence or absence of pixels in each section. The limitations of OCR is that the quality of the image can be lost and not worth the small amount of text. Also, it needs lots of space to store an image and even to process it. Based on the specific font or script used,

the resulting matrix is labeled as representing a particular character. This allows OCR to recognize and transcribe text from images, making it a useful tool for various applications. OCR also enables the conversion of large quantities of paper documents into digital files, improving the efficiency of text storage, processing, and searching. In summary, OCR is a valuable tool for digitizing and organizing text-based information, making it more accessible and easier to use. The network uses a CNN (Convolutional Neural Network) approach to classify the results into two categories, and it is able to generalize this binary classification effectively. The future work is to prove that to provide longer access time, Safe and secure usage will be provided through this. Table 2 procedure refers to the procedure of OCR algorithm.

Statistical Analysis

The statistical programme used to calculate the standard derivation, mean and standard error means, mean difference, sig, and F value uses IBM SPSS of version 26.0. The number of installations discovered in real time is an independent variable, and application access time is a dependent variable. An independent T-test analysis is carried out in this investigation.(Brum et al. 2023).

3 RESULTS

Table 1: Novel YOLO V3 SPP procedure for a novel (You Only Look Once Version3 spatial pyramid pooling). This Novel YOLO V3 SPP technique makes it possible to predict the used data outside of the application quickly. It also demonstrates the access value much better.

Input: CVE (Common Vulnerability and Exposures) dataset
Output: Longer access time
Step 1: First input is a captured natural scene image. Step 2: It undergoes through the convolutional layers, it uses 1*1 layer which predicts the size of the image. Step 3: Observing the image and calculating the weights in the image. Step 4: It has three anchors which are called anchors which predicts the log space. Step 5: The outcome is computed using access time and picture detection accuracy.

The Novel YOLO V3 SPP (You Only Look Once) procedure is shown in Table 1. And information is collected from the dataset. The novel YOLO V3 SPP operates by recognising each image in the surrounding natural scene. These parameters are specified for additional model testing. must make an effort to improve the access time. The OCR procedure is shown in Table 2. The Novel YOLO V3 SPP and OCR method is compared using the dataset. OCR predicts less accurately than Novel YOLO V3 SPP. It is therefore tested using the methods for faster access time. The raw data table of access time in Table 3 includes both the Novel YOLO V3 SPP and OCR.

Table 2: Procedure for OCR (Optical Character Recognition). The OCR algorithm takes the dataset of vulnerability in apps and helps to predict it by using this algorithm.

Input: CVE (Common Vulnerability Exposure) Dataset
Output: Longer access time
Step 1: Captured image from the natural scene is further divided into scales. Step 2: Observes the output and predicts the weight. Step 3: The image undergoes the neural networks techniques. Step 4: Dividing images in no of scales. Step 5: Finally, predicting the output by score generation.

Table 3: Table of raw data for access times Novel YOLO V3 SPP (You Only Look Once V3-Spatial Pyramid Pooling) and OCR (Optical Character Recognition).

S.NO	Novel YOLO V3 SPP (You Only Look Once V3-Spatial Pyramid Pooling) Access time (ms)	OCR (Optical Character Recognition) (Access time) (ms)
1	62	98
2	64	96
3	66	94
4	68	92
5	70	90
6	72	88
7	74	86
8	76	85
9	78	84
10	80	83
11	82	82
12	84	81
13	86	80
14	88	79
15	89	78
16	90	77
17	91	76
18	92	75
19	93	74
20	94	72
21	95	71
22	96	70
23	97	68
24	98	66
25	99	62

Table 4: Group statistics for contrasting Novel YOLO V3 SPP and OCR Algorithm using independent samples. The mean access time in Novel YOLO V3 SPP is 83.36 milliseconds, compared to 79.64 milliseconds in OCR.

	Algorithm	N	Mean	Std. Deviation	Std. Error Mean
Access time	Novel YOLO V3 SPP	25	83.36	11.626	2.325
	OCR	25	79.64	9.327	1.865

Table 5: T-Test for Comparing Independent Statistical Samples of Novel YOLO V3 SPP with OCR Algorithm, 95% confidence interval. It shows that there is no statistical significance difference between the Novel YOLO V3 SPP Algorithm and OCR Algorithm with p=0.218 (p>0.05).

		F	Sig	t	df	Sig(2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Access time	Equal Variances assumed	2.743	.104	1.248	48	.218	3.720	2.981	-2.274	9.714
	Equal variances not assumed			1.248	45.845	.218	3.720	2.981	-2.281	9.721

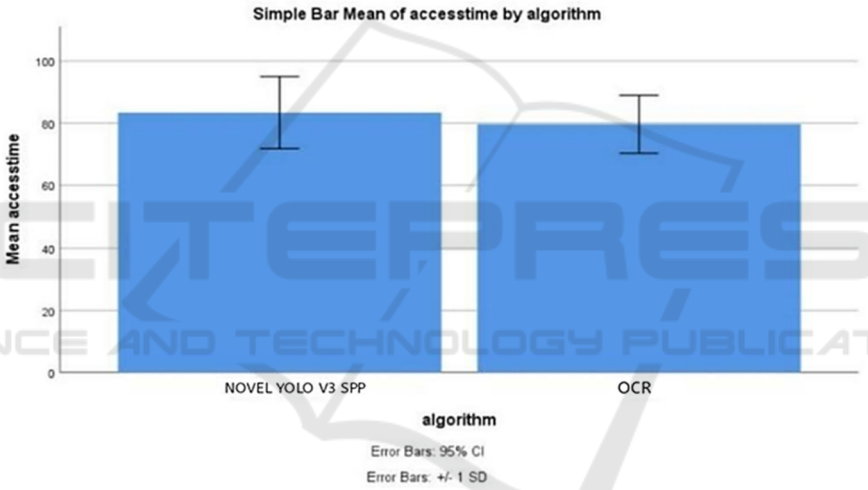

Figure 1: Comparison between Novel YOLO V3 SPP and OCR algorithm based on mean access time. The access time of Novel YOLO V3 SPP is significantly better than OCR algorithm. X-axis: Novel YOLO V3 SPP Vs OCR algorithm Y-axis: Mean access time. Error Bar +/- 1 SD.

The values for the Novel YOLO V3 SPP (You Only Look Once) and the OCR Algorithm are shown in Table 4 as N (25), Mean (83.36), Standard Deviation (11.626), and Std. Error Mean values (2.325) respectively. The T-Test results for statistically independent samples are shown in Table 5. The Novel YOLO V3 SPP and OCR algorithm has a mean difference of 3.720, a standard error of 2.981, and a 95% confidence interval. According to the results, there is no statistically significant difference between the Novel YOLO V3 SPP Algorithm and the OCR Algorithm with p=0.218 (p>0.05). The T-Test results for the Novel YOLO V3 SPP and OCR algorithm are shown in a bar graph in Figure 1. It displays the Novel YOLO V3 SPP and OCR algorithm's access time. The bar graph gain and values compute the access time and use it.

4 DISCUSSION

The YOLO V3 SPP access time has a significance value of 83.36, which is higher than the OCR rate. The OCR significance value of 73.64 is more than the significance of the YOLO V3 SPP method in terms of statistical outcome values. More than (p>0.05) is the no statistical significance value of 0.103.

The basic principle behind OCR learning is to combine the predictions of multiple base learners into

a single result that is expected to outperform any individual member of the group, along with an unrelated error on the target data sets (Tejas et al. 2016). Group learning is based on using different models to solve problems related to accuracy and access time (Yu 2021). The OCR algorithm is particularly effective when there is a significant difference between the models in terms of access time (Kariya, Fujishima, and Zhang 2019). To avoid errors due to multiple images being captured at once, the algorithm removes unwanted data outside the bounding boxes (Daneshfar, Fathy, and Alaqeband 2018). This also helps to select and predict specific objects or parts with an accuracy of 86% (Bao et al. 2022). One of the key advantages of OCR is that it is designed to meet all assumptions consistent with the training data, with an access time of 85% (Bao et al. 2022). Overall, OCR is a powerful tool for object detection and prediction, with a range of benefits and android applications (Xu, Xue, and Zhao 2022).

Factors affecting the research work are identifying and predicting data leakage in android applications using various algorithms, including the OCR algorithm as an object detection tool. The limitations of OCR is that the quality of the image can be lost and not worth a small amount of text. Also, it needs lots of space to store an image and even to process it. The version 3 of the OCR algorithm can be used to extract textual data from images, dividing the data into smaller sections to facilitate quick processing in android applications. The algorithm generates a grid for each image in the task and is useful for predicting text or objects in the virtual world. The OCR algorithm has many applications, including traffic control and license plate identification, as well as speed detection. However, it has limitations in terms of access time and accuracy, which may impact future work. Overall, the aim of this research is to improve the security and usability of android applications, while providing accurate and efficient text detection in images. And provide longer access time. The future work is to prove that to provide longer access time, Safe and secure usage will be provided through this in android applications.

5 CONCLUSION

Novel YOLO V3 SPP and the OCR algorithms have predicted real-time data leakage applications for Android using various trained detection datasets. When comparing the two algorithms, Novel YOLO V3 SPP has a higher access rate than the OCR algorithm. The Novel YOLO V3 SPP's performance and sensitivity are superior to the OCR's (83.36ms) (73.64ms). In comparison to the OCR method, data loss is reduced in the Novel YOLO V3 SPP.

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