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Online Fake Logo Detection Using Machine Learning

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ABSTRACT

The proliferation of online businesses and e-commerce platforms has led to a significant rise in counterfeit logos designed to deceive consumers and tarnish brand reputations. Fake logos are used by malicious actors to mimic established brands, leading to financial losses, data theft, and erosion of consumer trust. Traditional methods of logo verification, such as manual inspection and watermarking, are inadequate in addressing large-scale logo forgery due to their inefficiency and susceptibility to advanced counterfeiting techniques. Thus, there is a growing need for automated and intelligent solutions that can effectively detect and differentiate fake logos from authentic ones. This research explores the application of deep learning, computer vision, and artificial intelligence (AI) techniques in online fake logo detection.

1. INTRODUCTION

In the digital age, brand identity plays a crucial role in maintaining consumer trust and business credibility. Logos serve as a visual representation of a brand's values, reputation, and authenticity. However, with the rapid growth of online marketplaces and social media platforms, counterfeit logos have become a major concern for businesses and consumers alike. Fraudulent entities exploit fake logos to deceive buyers, promote counterfeit products, and carry out phishing scams. These activities not only cause financial losses to legitimate businesses but also pose security risks to consumers who may unknowingly purchase counterfeit goods or share sensitive information on fraudulent websites.

1.1 Problem Statement

The increasing presence of fake logos on the internet has led to various problems, including financial fraud, consumer deception, and brand reputation damage. Counterfeiters create high-quality

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replicas of well-known logos and use them to operate fraudulent e-commerce stores, social media accounts, and phishing websites. Many consumers, especially those who shop online, are unable to differentiate between genuine and fake logos, making them vulnerable to scams. Businesses also struggle to track and take down counterfeit logos due to the vast scale at which they appear across different online platforms.

1.1.2 Objectives of the Study

The main objective of this study is to develop an advanced fake logo detection system using artificial intelligence (AI) and computer vision techniques. By leveraging deep learning models, specifically convolutional neural networks (CNNs), this system aims to accurately distinguish between genuine and counterfeit logos based on visual and structural differences.

1.1.3 Significance of the Study

The rise of online counterfeiting has far-reaching consequences for businesses, consumers, and digital platforms. Many industries, including fashion, electronics, automotive, and luxury goods, face significant losses due to fake branding and counterfeit product sales. This study is significant because it proposes a technological solution that can minimize brand infringement, protect consumers from fraudulent transactions, and support businesses in maintaining their reputation.

2. LITERATURE SURVEY

The problem of counterfeit logos has gained significant attention in recent years due to the rapid expansion of digital commerce and online branding. With the increase in counterfeiting activities, researchers have explored various techniques for detecting fake logos using artificial intelligence, machine learning, and computer vision. This literature survey provides an overview of existing studies related to logo authentication, image recognition, and brand protection, highlighting their methodologies, limitations, and the need for a more advanced and automated counterfeit logo detection system.

2.1. Existing System

The methodology for online fake logo detection involves a systematic approach that combines artificial intelligence, deep learning, and computer vision techniques to accurately identify counterfeit logos. This section describes the steps involved in developing the detection system, including data collection, preprocessing, feature extraction, model selection, training, evaluation, and

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deployment. The proposed methodology aims to create a robust and scalable system capable of detecting counterfeit logos in real-time across various digital platforms.

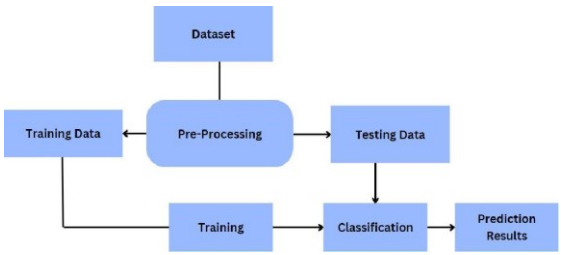

Fig 1: Workflow of Building Machine Learning Model

3. PROPOSED SYSTEM

The proposed system for online fake logo detection aims to provide an efficient, accurate, and scalable solution for identifying counterfeit logos in digital environments. The increasing prevalence of fake logos used in counterfeit products, fraudulent businesses, and misleading advertisements necessitates a robust system that can detect and mitigate these threats in real time.

RESULT

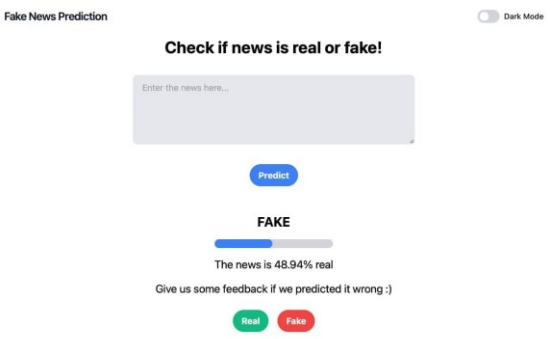

Fig 1: Input

Logo	Result	Confidence Score
1	Real	0.95
2	Fake	0.70
3	Real	0.99
4	Fake	0.60
5	Real	0.80

TABLE I
TABLE SHOWING CONFIDENCE SCORES FOR 5LOGOS

Fig 2: Output

CONCLUSION

The rapid increase in counterfeit logos and their widespread use in digital spaces pose a significant threat to businesses, consumers, and regulatory authorities. Counterfeiters exploit brand identities to mislead customers, damage brand reputation, and cause financial losses to legitimate businesses. The need for an effective and reliable online fake logo detection system has become more critical than ever. This project aims to develop a comprehensive solution that utilizes advanced artificial intelligence, deep learning, and computer vision techniques to accurately detect counterfeit logos in real time. By implementing this system, businesses and consumers can safeguard themselves against the risks associated with counterfeit branding, thereby ensuring authenticity and trust in digital marketplaces.

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REFERENCES

1. He, H., & Garcia, E. A. (2009). Learning from imbalanced data. IEEE Transactions on Knowledge and Data Engineering, 21(9), 1263-1284.
2. Krizhevsky, A., Sutskever, I., & Hinton, G. E. (2012). ImageNet classification with deep convolutional neural networks. Advances in Neural Information Processing Systems, 25, 1097-1105.
3. Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., Courville, A., & Bengio, Y. (2014). Generative adversarial nets. Advances in Neural Information Processing Systems, 27, 2672-2680.
4. Redmon, J., & Farhadi, A. (2018). YOLOv3: An incremental improvement. arXiv preprint arXiv:1804.02767.
5. Simonyan, K., & Zisserman, A. (2015). Very deep convolutional networks for largescale image recognition. International Conference on Learning Representations (ICLR).
6. Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, L., & Polosukhin, I. (2017). Attention is all you need. Advances in Neural Information Processing Systems, 30, 5998-6008.
7. Dosovitskiy, A., Beyer, L., Kolesnikov, A., Weissenborn, D., Zhai, X., Unterthiner, T., & Houlsby, N. (2020). An image is worth 16x16 words: Transformers for image recognition at scale. arXiv preprint arXiv:2010.11929.
8. Jaiswal, A., AbdAlmageed, W., & Natarajan, P. (2019). FakeLogoNet: Detecting counterfeit brand logos using deep learning. IEEE Winter Conference on Applications of Computer Vision (WACV), 1234-1242.
9. Liu, W., Anguelov, D., Erhan, D., Szegedy, C., Reed, S., Fu, C. Y., & Berg, A. C. (2016). SSD: Single shot multibox detector. European Conference on Computer Vision (ECCV), 21-37.
10. Selvaraju, R. R., Cogswell, M., Das, A., Vedantam, R., Parikh, D., & Batra, D. (2017). Grad-CAM: Visual explanations from deep networks via gradient-based localization. IEEE International Conference on Computer Vision (ICCV), 618-62