

# Survey Paper On "Fake Products Detection Using Machine Learning"

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Abstract— The proliferation of counterfeit products and fraudulent branding presents significant challenges for consumers and businesses alike. The Fake Product & Fake Logo Identification System aims to address these challenges by leveraging advanced machine learning and computer vision techniques to accurately identify counterfeit items and logos. This system employs a combination of image recognition, pattern analysis, and AI-driven algorithms to detect discrepancies between genuine and fake products by analyzing subtle differences in logos, packaging, and design elements. By utilizing a comprehensive database of authentic product images and logos, the system compares and flags anomalies indicative of counterfeiting. The goal is to provide a reliable, scalable, and user-friendly solution that empowers consumers and businesses to combat the adverse effects of counterfeit products, enhancing trust and safety in the marketplace.

Keywords: Fake Product & Fake Logo Identification System, counterfeit items and logos, of image recognition, pattern analysis, and AI-driven algorithms.

#### I. INTRODUCTION

Counterfeit goods and fake branding are pervasive issues that undermine consumer trust, compromise safety, and impact the economy. Among the most pressing concerns for brands and consumers is the identification of fake logos, which are often used to deceive buyers and bypass intellectual property rights. The Fake Logo Identification System is designed to address these challenges through the integration of cutting-edge technology in computer vision and artificial intelligence. This system facilitates the detection and identification of counterfeit logos by analyzing images and comparing them to verified databases of authentic logos. By employing deep learning models trained on extensive datasets of genuine and fake branding examples, the system can spot subtle differences in design, typography, color, and other intricate features that may be overlooked by the human eye.

## II. METHODOLOGY

Image-Based Feature Extraction with CNNs: Alongside OCR, Convolutional Neural Networks (CNNs) are used to analyze the visual features of the product. CNNs excel at identifying complex patterns in images, making them ideal for detecting visual inconsistencies that are indicative of counterfeiting. For example, CNNs can recognize poor-quality logos, misaligned packaging, or counterfeit text that may have been altered during the reproduction process. Pretrained CNN models such as ResNet or VGG16 can be fine-tuned on a dataset of genuine and counterfeit product images to enhance their ability to differentiate between the two. Fake product detection using machine learning with QR code scanning and CNN (Convolutional Neural Networks) offers an effective approach by combining the verification of product authenticity through scannable data and advanced image analysis. In this methodology, the process begins with QR code scanning, where a product's QR code is scanned to retrieve embedded information, such as serial numbers, product origin, or authenticity data. This information is then verified against a trusted database to check for discrepancies or mismatches, signaling a potential counterfeit. Simultaneously, CNNs are employed to analyze the product's visual features, such as logos, packaging quality, and design elements. CNNs can detect subtle visual inconsistencies, like poor-quality printing or altered logos, that are often present in counterfeit products.

#### III. LITERATURE SURVEY

[1] One Time QR-Code for Fake Product Identification Author: Pothreddypally Jhansi Devi , Manideep Sai Dutta , and Madhusudhan Damerakonda. Description: The current supply chain contains a large number of counterfeit goods. It is essential to have a system in place that allows customers to verify all the information about the product customers are purchasing in order to determine whether or not it is authentic. Counterfeit goods have been a significant factor in the manufacturing of goods in recent years. [2] Detection of Fake Products Using Blockchain Author: Swathi Y; A K N S Madhurima Gayathri; Aishwarya R Pai; Ashwini R Doke; Sanjana S Description: Manufacturing and selling of counterfeit items and goods endangers end consumers' financial, health, and safety. Additionally, it affects the economic expansion of original manufacturers and businesses through revenue loss, product slander, downtime, replacement costs, the



need for brands to spend money fending off counterfeits, sales theft, etc. To combat these critical counterfeiting consequences, a blockchain-based system is utilized to identify original items and detect forged products to secure the identification of genuine commodities. [3] Enhancing Fake Products Detection Using Deep Learning Object Detection Models. Author: Eduard Daoud, Dang Vu, Hung Nguyen and Martin Gaedke. Description: The presence of counterfeit products in the market are increasing, the intervention of inspection bodies and authorities alone is obviously not sufficient, but consumers could make their contribution and improve the situation. In this paper, we research the possibility to reduce counterfeit products using machine learning-based technology. Image and text recognition, and classification based on machine learning have the potential to become the key technology in the fight against counterfeiting. Image recognition and classification of product information empowers the end customer to identify counterfeits accurately and efficiently by comparing them with trained models.

## **IV. SYSTEM ARCHITECTURE**



## V. CONCLUSION

Numerous tools are available for the detection of counterfeit goods, but they just photograph the barcode. This study's goal is to suggest a method for build a tool that would record the image of the product QR code and process it using ML and QR code technique to determine whether a product is genuine or fraudulent. This programmed will demonstrate portability and simple to use It will be very beneficial.

# VI. REFERENCES

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