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Document Plagiarism Detector

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Abstract: In recent years, digital technologies have been widely used to improve the verification of important documents and reduce fraudulent activities. Certificates are essential for education and employment, but the rise of fake certificates has created serious challenges for organizations. Traditional verification methods are mostly manual, time-consuming, and may lead to errors or delays. To overcome these issues, this project focuses on developing a Certificate Forgery Detection System using Artificial Intelligence and image processing techniques. The system allows users to upload a certificate image, which is then preprocessed to enhance quality and remove noise. Important features such as text, logos, signatures, and seals are extracted and analyzed to identify patterns. A machine learning model is used to classify whether the certificate is genuine or fake by comparing it with trained data. Additional verification methods like QR code or database matching can also be included to improve accuracy. The system provides a simple interface for users to get quick results and may include an AI-based assistant to explain the output. Experimental results show that the system can detect forged certificates with good accuracy and in less time. This solution is useful for educational institutions, companies, and organizations to ensure document authenticity, reduce manual effort, and prevent fraud effectively.
Keywords: Certificate Verification, Forgery Detection, Artificial Intelligence, Image Processing, Machine Learning, Document Authentication, Optical Character Recognition (OCR), Fraud Detection, QR Code Validation, Digital Verification System

I. INTRODUCTION

Certificates are very important documents used in education, employment, and identification. They prove a person’s qualifications and achievements. However, in recent years, the number of fake certificates has increased significantly. Many people create forged documents to gain jobs or admissions illegally. These fake certificates can cause serious problems for organizations and reduce trust in the system. Traditionally, certificate verification is done manually by authorities. This process takes time and depends on human observation. It may also lead to errors if the verification is not done carefully. In many cases, organizations do not have a proper system to quickly verify certificates. Because of this, there is a need for an automated system that can detect fake certificates efficiently. Artificial Intelligence and image processing techniques are now widely used to solve such problems. Machine learning models can analyze document images and identify patterns such as text structure, logos, seals, and signatures. These features help in distinguishing between genuine and forged certificates. In this project, we develop a system that uses AI to detect certificate forgery. The system analyzes the uploaded certificate image and predicts whether it is real or fake. Additionally, a chatbot is included to guide users and explain the results. The goal of this project is to provide a fast, accurate, and user-friendly solution for certificate verification.

II. CONTRIBUTIONS OF THE PROPOSED WORK

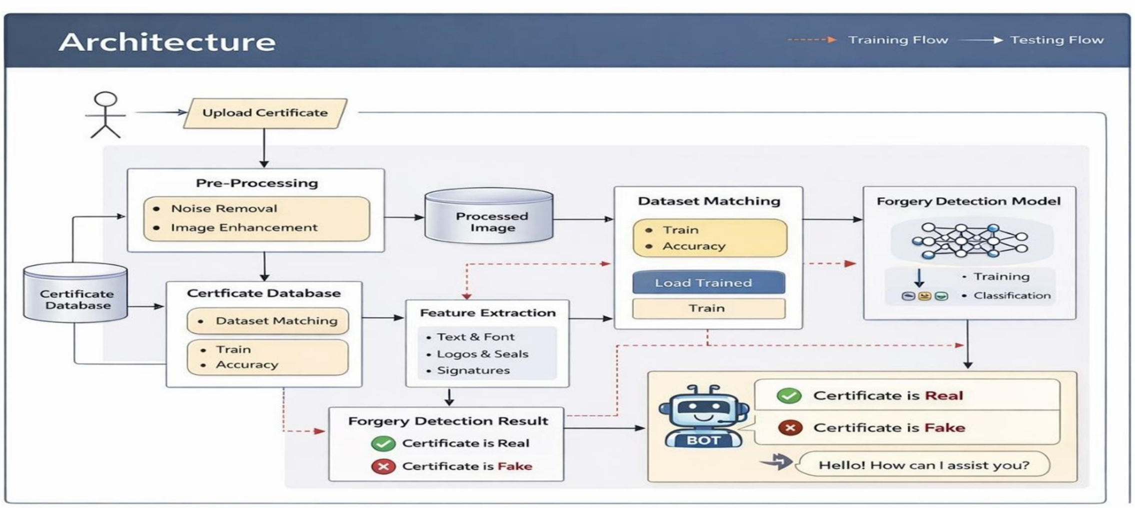
1) AI-Based Certificate Verification System: This project develops a system that automatically detects whether a certificate is genuine or fake using artificial intelligence.
2) Step by Step Verification Process: The system follows a structured process including image upload, preprocessing, feature extraction, and classification.
3) Image Processing for Feature Extraction: Important features such as text, logos, signatures, and seals are extracted from the certificate for analysis.
4) Machine Learning Model for Classification: A trained model is used to compare extracted features and classify the certificate as real or fake.
5) Improved Accuracy and Performance: Parameter tuning and optimization techniques are used to improve the accuracy and efficiency of the system.
6) User-Friendly Interface with Chatbot Support : A chatbot is integrated to help users understand the results and provide guidance about verification.

III. LITERATURE SURVEY

Many researchers have worked on document verification and forgery detection using image processing and machine learning. Earlier methods mainly focused on basic image features such as color, texture, and edge detection. These features were then used with machine learning algorithms like Support Vector Machine, Decision Tree, and K Nearest Neighbour to classify documents. However, these methods had limitations. Their accuracy depended heavily on image quality and they required manual feature selection. With the development of deep learning, more advanced approaches have been introduced. Convolutional Neural Networks (CNNs) are widely used for document analysis because they can automatically learn features from images. CNN models can identify patterns such as fonts, layouts, logos, and signatures in certificates. Transfer learning is also commonly used, where pre-trained models like VGG, Res Net, and Mobile Net are fine-tuned for document verification tasks. This improves accuracy and reduces training time. Some research also focuses on Optical Character Recognition (OCR) to extract text from certificates and compare it with database records. QR code-based verification is another approach, where certificates include a unique code that can be scanned and validated. Despite these advancements, many systems focus only on either image analysis or database verification. Very few systems combine multiple techniques into a single platform. Therefore, this project aims to integrate image processing, machine learning, and chatbot interaction into one complete certificate verification system.

IV. PROPOSED SYSTEM ARCHITECTURE

The proposed system is designed in a modular way for efficient certificate verification. It consists of five main stages: image collection, preprocessing, feature extraction, classification, and user interaction. First, the user uploads a certificate image through a web interface. The system then processes the image in the backend. In the preprocessing stage, the image is cleaned to remove noise and improve clarity. The important areas of the certificate such as text, logo, and signature are highlighted. Next, feature extraction is performed to analyze key elements of the certificate. These features are then passed to the classification module. A machine learning model is used to study these features and determine whether the certificate is genuine or forged. The model compares the input with trained data and produces a prediction. The system may also include additional verification methods such as QR code scanning or database matching to improve accuracy. After classification, the result is displayed to the user. The interface shows whether the certificate is real or fake along with a confidence score. An AI chatbot is also included to assist users by explaining the result and providing guidance. The system is flexible and can be enhanced with more advanced models or converted into a mobile application in the future. Overall, this system provides a fast, reliable, and user-friendly solution for detecting certificate forgery. The proposed system is designed to provide a secure, efficient, and automated solution for certificate verification using advanced technologies. It integrates image processing, machine learning, and validation techniques into a single platform to detect forged certificates accurately. The system not only analyzes visual features such as text structure, logos, seals, and signatures but also checks for hidden inconsistencies and tampering patterns that are difficult to identify manually. It is built with a scalable architecture so that it can handle large volumes of certificate verification requests in real time. The system can also be integrated with institutional databases or verification portals to cross-check certificate details, further improving reliability. Security measures are included to ensure safe handling of sensitive document data during upload and processing.



V. PROPOSED METHODOLOGY

The proposed method follows a step by step process to detect certificate forgery. The process begins with image collection, where users upload a certificate image through a web application or capture it using a camera. The uploaded image is then sent to the system for processing. In the preprocessing stage, the image is cleaned and enhanced by reducing noise and adjusting brightness and contrast to improve quality for better analysis.

Next, the system identifies important regions of the certificate such as text, logos, seals, signatures, and QR codes, which are considered as the Region of Interest. By focusing only on these areas and removing unnecessary background, the system improves accuracy and reduces computation. After this, feature extraction is performed where characteristics like font style, alignment, logo patterns, seal structure, and signature details are analyzed.

These features are then passed to a classification stage, where a machine learning or deep learning model trained on genuine and forged certificates predicts whether the certificate is real or fake. The system then displays the result along with a confidence score to indicate prediction reliability. Additional verification methods such as QR code validation or database matching can also be used to enhance accuracy.

To improve user interaction, an AI chatbot is included to explain the results in simple language and guide users on further steps such as manual verification if needed. The system performance is evaluated using metrics like accuracy, precision, recall, and F1 score, along with a confusion matrix to analyze prediction results.

Overall, this method provides a complete and efficient solution for certificate forgery detection by combining image processing, machine learning, and user-friendly features.

VI. IMAGE ACQUISITION

The image acquisition stage is the first step in the certificate verification process. In this step, the user uploads a certificate image using a scanner, mobile phone camera, or any digital device. The system supports different image formats and resolutions, allowing users to upload certificates from various sources. Once the image is captured or uploaded, it is sent to the backend system for further processing.

The quality of the image plays a very important role in accurate detection. Users should ensure that the certificate is clearly visible, with proper lighting and without shadows or reflections. The image should be captured in a straight angle to avoid distortion and should include the full certificate without cropping important details. Key elements such as text, logos, seals, signatures, and QR codes must be clearly visible for proper analysis.

A simple and clean background is preferred to avoid noise in the image. High-quality images help improve preprocessing, feature extraction, and overall model performance, leading to more accurate and reliable certificate verification results. The image acquisition stage is the first step in the certificate verification process. In this step, the user uploads a certificate image using a scanner, mobile phone camera, or any digital device. The system supports different image formats and resolutions, allowing users to upload certificates from various sources. Once the image is captured or uploaded, it is sent to the backend system for further processing.

The quality of the image plays a very important role in accurate detection. Users should ensure that the certificate is clearly visible, with proper lighting and without shadows, reflections, or blur. The image should be captured at a straight angle to avoid distortion and should include the full certificate without cutting any part. Important elements such as text, logos, seals, signatures, watermarks, and QR codes must be clearly visible for proper analysis. The system may also perform automatic resizing and normalization to maintain consistency across different images. Users are advised to avoid low-resolution images, as they may affect the detection accuracy.

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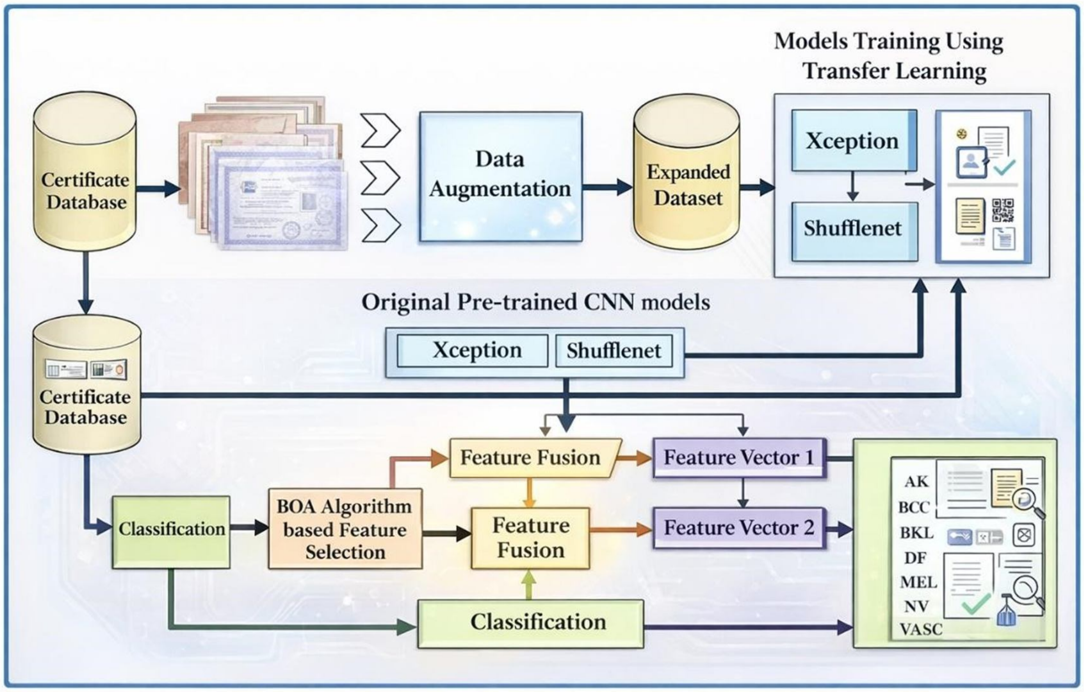

VII. IMAGE PREPROCESSING

Image preprocessing is an important step in the certificate forgery detection system. Certificate images may contain noise, uneven lighting, shadows, or unwanted background elements that can affect the performance of the model. Therefore, the images are cleaned and enhanced before further processing. First, noise removal techniques such as Gaussian filtering or median filtering are applied to remove small distortions and improve clarity. After that, the image is resized to a fixed dimension, typically 224 × 224 pixels, so that it matches the input requirements of the machine learning or deep learning model and reduces computational complexity. Next, normalization is performed where pixel values are scaled to a standard range, usually between 0 and 1, which helps in faster and more stable model training. In some cases, color space conversion is also applied, converting images from RGB to formats like grayscale or HSV to highlight important features such as text contrast, seals, and signatures more clearly. Additional preprocessing steps such as contrast enhancement, edge sharpening, and morphological operations may be used to improve the visibility of important certificate components. Data augmentation techniques like rotation, flipping, zooming, brightness adjustment, and slight shifting are also applied to increase dataset diversity and make the model robust to real-world variations. After preprocessing, the images are converted into numerical arrays called tensors, which are used by deep learning frameworks like TensorFlow or PyTorch. In some cases, region-based processing is applied to focus only on important areas such as text, logos, and signatures. Batch processing is used during training to handle multiple images efficiently without overloading memory. Overall, image preprocessing standardizes and enhances the certificate images, helping the model extract better features and improving the accuracy and reliability of forgery detection. Image preprocessing also plays a key role in improving the consistency and reliability of certificate analysis. Since certificates may come from different sources such as scanned copies, photographs, or digital files, there can be variations in resolution, orientation, and lighting conditions. To handle this, additional preprocessing steps like image alignment and rotation correction are applied to ensure that the certificate is properly oriented. Skew correction techniques help straighten tilted images, making text and structural elements easier to analyze. Background removal methods may also be used to eliminate unnecessary regions and focus only on the document area. Contrast stretching and histogram equalization techniques can further enhance the visibility of faded text, stamps, or watermarks. In some cases, binarization is applied to convert the image into black and white, which helps in better text extraction and analysis.

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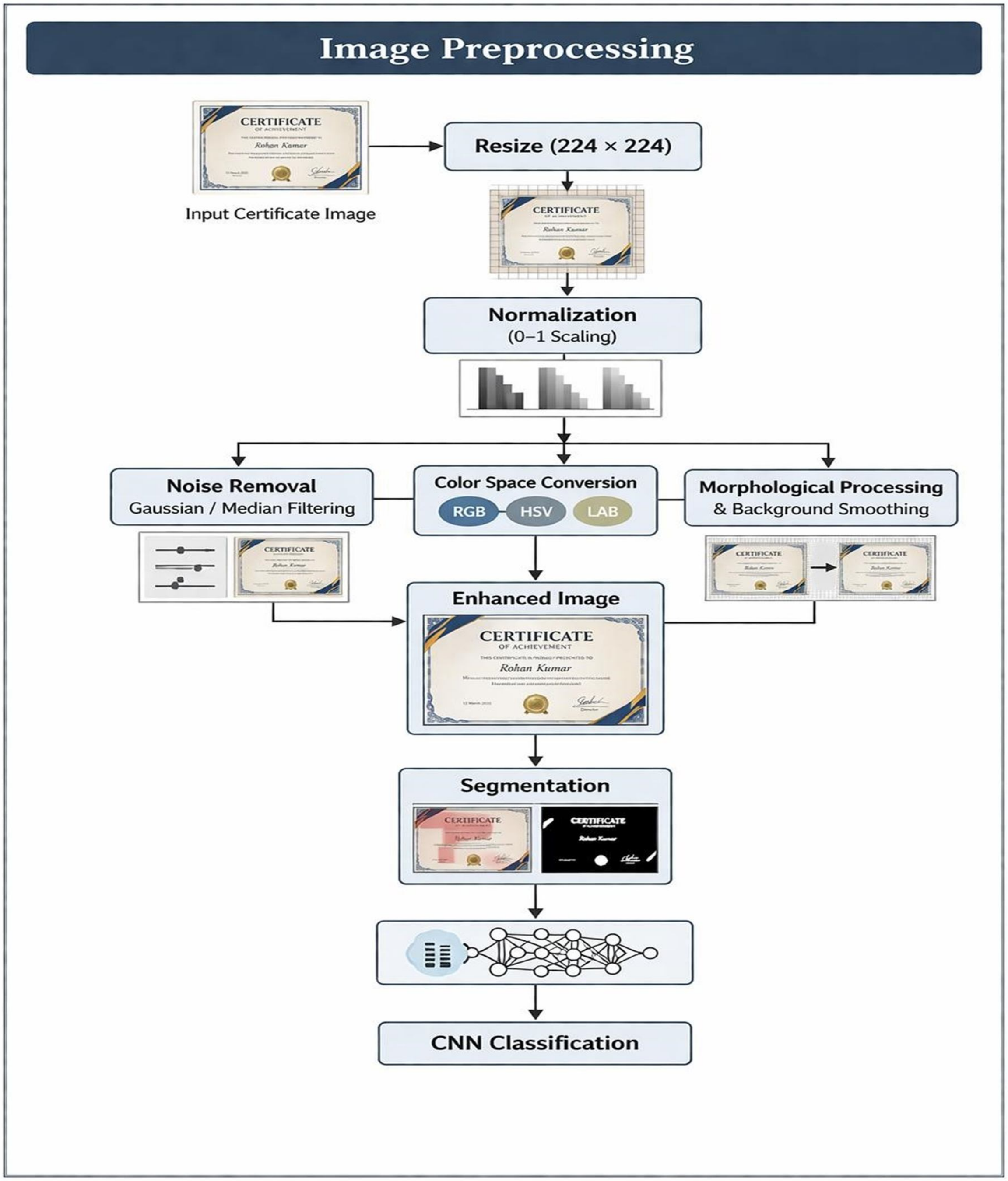
These preprocessing techniques ensure that the input data is uniform and optimized for feature extraction and classification. By improving image clarity and standardization, the system can more accurately detect subtle differences between genuine and forged certificates, leading to better performance and more dependable verification results. Another important aspect of image preprocessing is enhancing the structural and textual clarity of the certificate to support accurate analysis. Certificates often contain fine details such as microtext, borders, watermarks, and intricate seal designs, which may not be clearly visible in raw images. To address this, techniques like edge detection and sharpening are applied to highlight boundaries and important patterns within the document. Text enhancement methods can also be used to make printed content more readable, which is useful for further analysis or integration with OCR systems. Additionally, noise caused by compression or scanning artifacts is reduced using smoothing filters while preserving important features. In some cases, cropping is performed to remove unnecessary margins and focus only on the main certificate area. Illumination correction techniques are also applied to handle uneven lighting conditions across the image.



VIII. SEGMENTATION AND FEATURE EXTRACTION

Segmentation is used to identify and isolate the important regions of the certificate that are required for forgery detection. In this step, the system separates key components such as text areas, logos, seals, signatures, and QR codes from the background. This is important because it allows the model to focus only on relevant parts of the certificate instead of processing unnecessary information.

By concentrating on these regions of interest, the system improves accuracy and reduces computational complexity. After segmentation, the next step is feature extraction, where meaningful patterns are identified from the selected regions. These features help the system understand the characteristics of genuine and forged certificates. Text-based features include font style, spacing, alignment, and formatting consistency.

Logo and seal features analyze shapes, textures, and design patterns to detect irregularities. Signature analysis focuses on stroke patterns, curvature, and writing style. Color features are also important, where the system studies color distribution and detects unusual variations using histograms. Structural features such as layout alignment, margins, and positioning of elements are also considered.

Basic statistical measures like mean, variance, and distribution of pixel values are used to describe the image properties. In deep learning-based systems, many of these features are automatically learned using a Convolutional Neural Network. The early layers of the network detect simple patterns like edges and textures, while deeper layers capture complex structures such as logos and signatures.

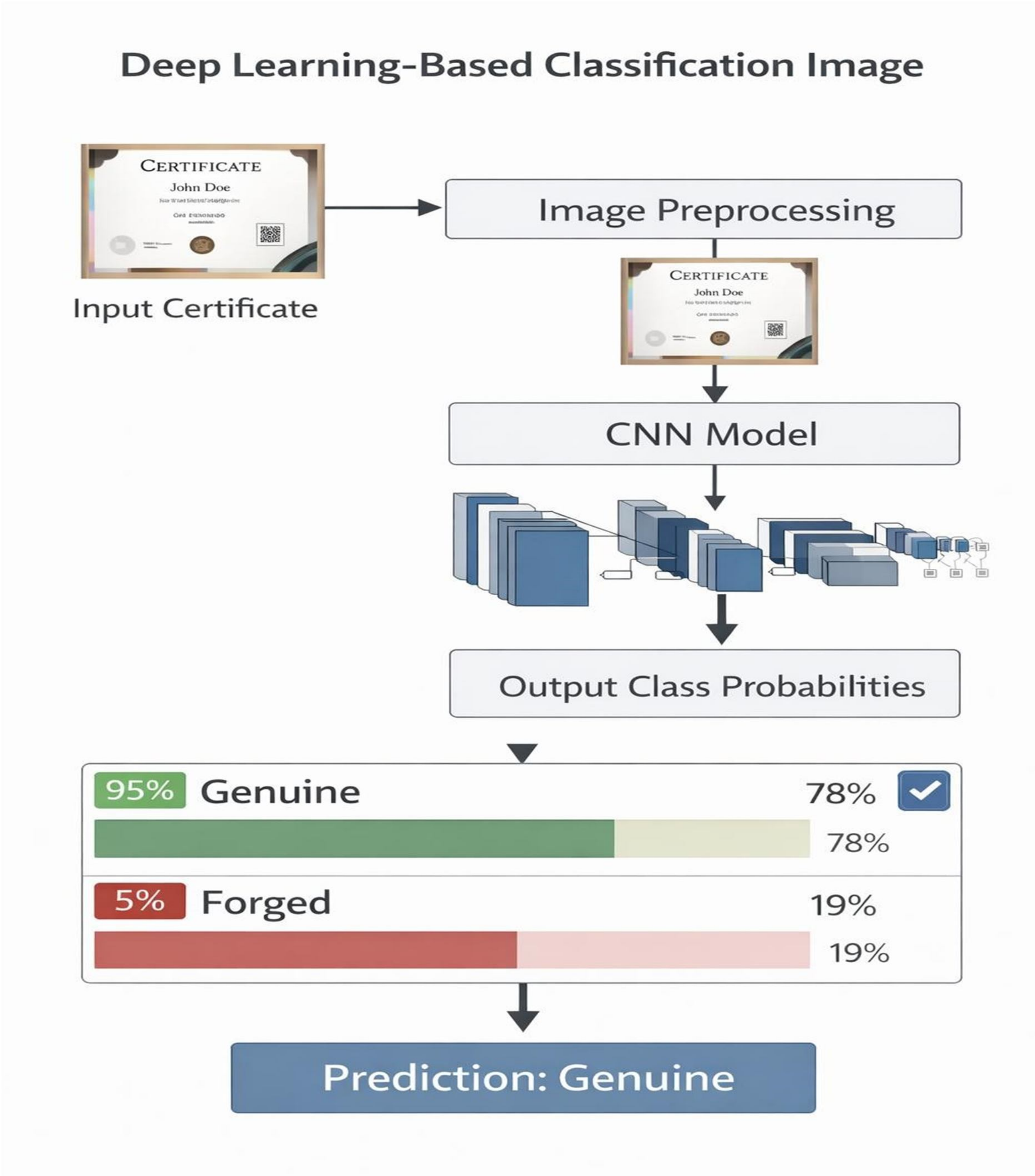
These learned feature maps store important visual information, which is then passed to fully connected layers for final classification. Because the model learns features automatically, it can adapt to different certificate formats and detect subtle differences between genuine and fake documents, making the system more accurate and reliable.

IX. DEEP LEARNING-BASED CLASSIFICATION

The classification stage is the core component of the certificate forgery detection system, where the final decision is made about whether a certificate is genuine or fake. In this step, the features extracted from the important regions of the certificate, such as text, logos, seals, signatures, and QR codes, are passed into a deep learning model for analysis. The process begins with the segmented region of interest, which contains the most relevant parts of the certificate. The image is resized to a standard dimension, typically 224×224 pixels, and normalization is applied to maintain consistent pixel value ranges. Data augmentation techniques such as rotation, flipping, zooming, brightness adjustment, and slight shifting are also used to increase the diversity of training data and make the model more robust to real-world variations.

Inside the neural network, these processed inputs pass through multiple layers, including convolutional layers and fully connected layers, where the model learns both simple and complex patterns such as font consistency, alignment, seal authenticity, and signature structure. At the final stage, a Softmax function is used to calculate the probability of the certificate belonging to each class, such as genuine or forged. The class with the highest probability is selected as the final prediction. During training, the model improves its performance by minimizing a loss function, typically binary or categorical cross-entropy, using optimization algorithms such as Adam or Stochastic Gradient Descent.

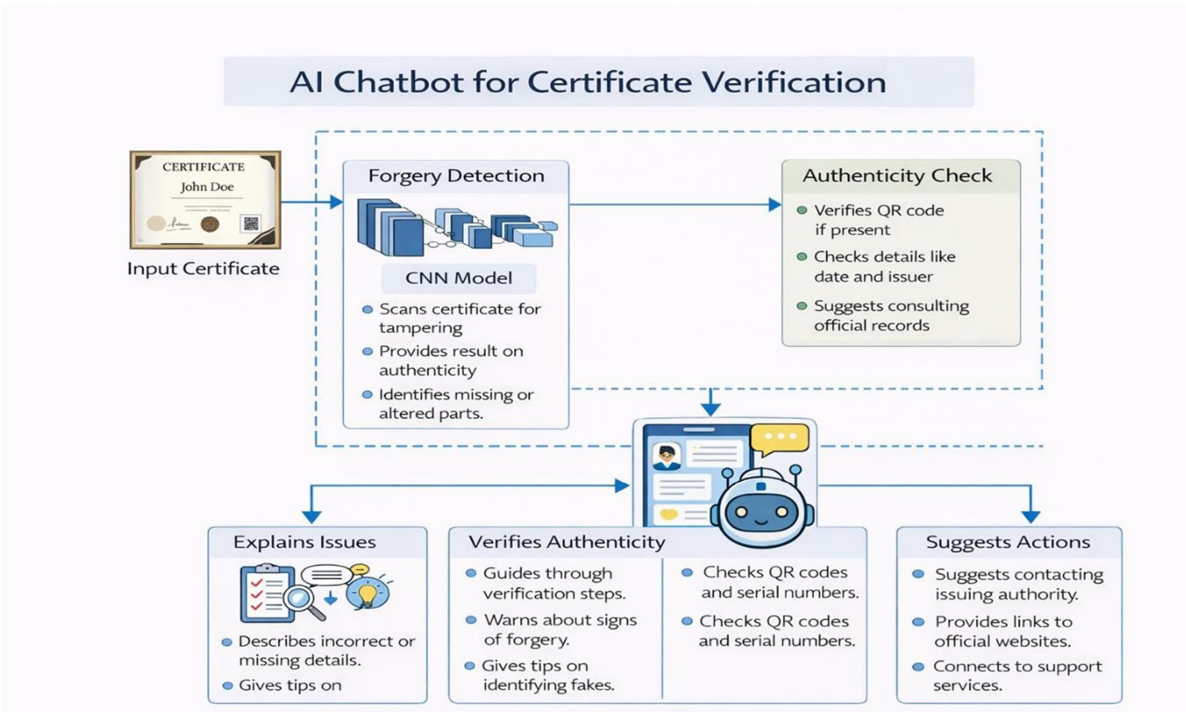
Backpropagation is used to update the model weights iteratively over multiple epochs, allowing the model to learn from errors and improve accuracy. In cases where the dataset is limited, transfer learning techniques can be applied using pretrained models such as ResNet, VGG, MobileNet, or EfficientNet, which are fine-tuned for certificate verification tasks. This approach helps achieve better performance with less training time. The effectiveness of the classification model is evaluated using metrics such as accuracy, precision, recall, F1 score, and ROC-AUC, which provide a comprehensive understanding of the system's performance. The system also generates a confidence score for each prediction to indicate reliability. If the confidence level is low or uncertain, the integrated chatbot can guide the user to perform manual verification or consult the issuing authority. Overall, the deep learning-based classification model enables the system to automatically analyze certificate features and accurately distinguish between genuine and forged documents, making the process faster, more reliable, and efficient. The classification stage uses a deep learning model to determine whether a certificate is genuine or fake. Extracted features are processed through neural network layers, and a Softmax function predicts the final result. The model is trained using optimization techniques, and performance is evaluated using accuracy and other metrics.



X. INTELLIGENT CHATBOT-BASED DIAGNOSTIC ASSISTANCE

An AI chatbot is integrated into the certificate forgery detection system to make the results more understandable and user-friendly. Many users may not clearly understand the technical output of the model, so the chatbot helps explain the result in simple language. After the deep learning model analyzes the uploaded certificate and predicts whether it is genuine or forged along with a confidence score, the chatbot interacts with the user to provide clear guidance. It explains why the certificate might be considered real or fake by referring to factors such as inconsistencies in text format, logo irregularities, signature mismatches, or missing security features. In addition to explaining the result, the chatbot can ask simple follow-up questions, such as where the certificate was obtained or whether it has been verified before, to provide more context-aware assistance. Based on the prediction and user responses, the chatbot offers useful suggestions, such as verifying the certificate through official portals, checking QR codes, or contacting the issuing authority.

It can also guide users on how to avoid certificate fraud and ensure authenticity in the future. Another important feature is support for quick assistance, where the chatbot can provide step-by-step instructions for manual verification if needed. In some cases, it can also suggest relevant official websites or organizations for further validation. Overall, the chatbot enhances the system by making it interactive, informative, and easy to use, ensuring that users not only receive a prediction but also understand the result and take appropriate action confidently. The intelligent chatbot also plays an important role in improving user experience and accessibility of the system. It provides real-time interaction, allowing users to quickly clarify doubts about the verification process and results. The chatbot is designed to be simple and easy to use, so even non-technical users can understand the system without difficulty. It can support multiple languages, making the system accessible to a wider range of users. In addition, the chatbot can store basic interaction history to provide more personalized responses and guidance. It can also give alerts or warnings if a certificate appears highly suspicious and recommend immediate verification through official sources. By combining automated analysis with conversational support, the chatbot ensures that users receive not only accurate results but also proper guidance, making the entire certificate verification process more efficient, reliable, and user-friendly.



XI. PERFORMANCE EVALUATION METRICS

The performance of the certificate forgery detection system is evaluated using several important metrics. These metrics help in understanding how well the model can identify whether a certificate is genuine or fake. Since incorrect verification can lead to serious issues such as fraud or rejection of valid documents, it is important to analyze the system carefully. The evaluation process starts with a confusion matrix, which compares the predicted results with the actual results. It consists of four values: True Positive, True Negative, False Positive, and False Negative. A True Positive means the system correctly identifies a forged certificate. A True Negative means the system correctly identifies a genuine certificate. A False Positive occurs when a genuine certificate is wrongly classified as fake, while a False Negative occurs when a fake certificate is incorrectly classified as genuine.

Accuracy measures how many predictions are correct out of all predictions made by the model. It is calculated using the formula:

Accuracy = (TP + TN) / (TP + TN + FP + FN)

However, accuracy alone may not always give a clear picture, especially when the dataset is imbalanced. Precision measures how many certificates predicted as fake are actually fake, calculated as:

Precision = TP / (TP + FP)

High precision means fewer genuine certificates are wrongly marked as fake.

Recall measures how well the system detects actual forged certificates and is calculated as

Recall = TP / (TP + FN)

This is very important because missing a fake certificate can lead to serious fraud. The F1 score combines both precision and recall into a single value, calculated as:

2 × (Precision × Recall) / (Precision + Recall)

It provides a balanced evaluation of the model. By analyzing all these metrics together, we can ensure that the certificate verification system is accurate, reliable, and suitable for real-world applications.

XII. RESULTS AND DISCUSSION

The experimental results show that the proposed system performs effectively in detecting forged and genuine certificates. The model achieved high accuracy when tested on the dataset and was able to maintain consistent performance across different certificate formats. The optimization techniques used in the system helped improve training speed and reduced computational cost during both training and prediction phases. As a result, the system can provide verification results quickly and efficiently. The classification results indicate that the model can successfully identify forged certificates by analyzing features such as text alignment, logo patterns, seals, and signatures. Precision and recall values show that the system can accurately detect fake certificates while minimizing false alarms on genuine ones. The F1 score further confirms that the model performs well even when the dataset contains an imbalance between genuine and forged samples. The confusion matrix provides deeper insight into the model's predictions. A few misclassifications were observed in cases where forged certificates closely resemble genuine ones, especially when high-quality forgeries mimic original layouts, fonts, and seals. In such cases, the system may occasionally classify them incorrectly. However, the feature extraction and preprocessing steps helped improve detection accuracy by focusing on key regions such as logos, signatures, and QR codes. These steps reduced noise and enhanced important details, leading to better predictions and fewer false negatives. The deep learning model was able to learn both simple and complex patterns from certificate images, where initial layers captured basic features like edges and text, and deeper layers identified complex structures and inconsistencies.

XIII. CONCLUSION

This research presents an AI-based system for detecting certificate forgery. The system uses image processing and deep learning techniques to analyze certificate images and determine whether they are genuine or fake. The main goal of the project is to improve the verification process and make it faster, more accurate, and easily accessible. The system follows a step by step approach. First, the certificate image is preprocessed to enhance quality and remove noise. Then, important regions such as text, logos, seals, signatures, and QR codes are identified. After that, a deep learning model analyzes these features and predicts the authenticity of the certificate. The system also focuses on important regions of the certificate before classification, which improves feature extraction and prediction accuracy. By analyzing only relevant parts and ignoring unnecessary background, the model performs more efficiently. Overall, the proposed system integrates image preprocessing, feature extraction, deep learning classification, and chatbot assistance into a single platform. It helps in reducing fraud, saving time, and improving trust in certificate verification. This system can be useful for educational institutions, companies, and organizations where document authentication is essential. An important part of this system is the integration of a chatbot. The chatbot works along with the prediction model to help users understand the results in simple language. It explains whether the certificate is genuine or forged, highlights possible issues, and provides guidance for further verification. This makes the system more user-friendly and accessible even for non-technical users. By combining automated analysis with interactive support, the system becomes more practical for real-world use. It not only detects forgery but also guides users on what actions to take next.

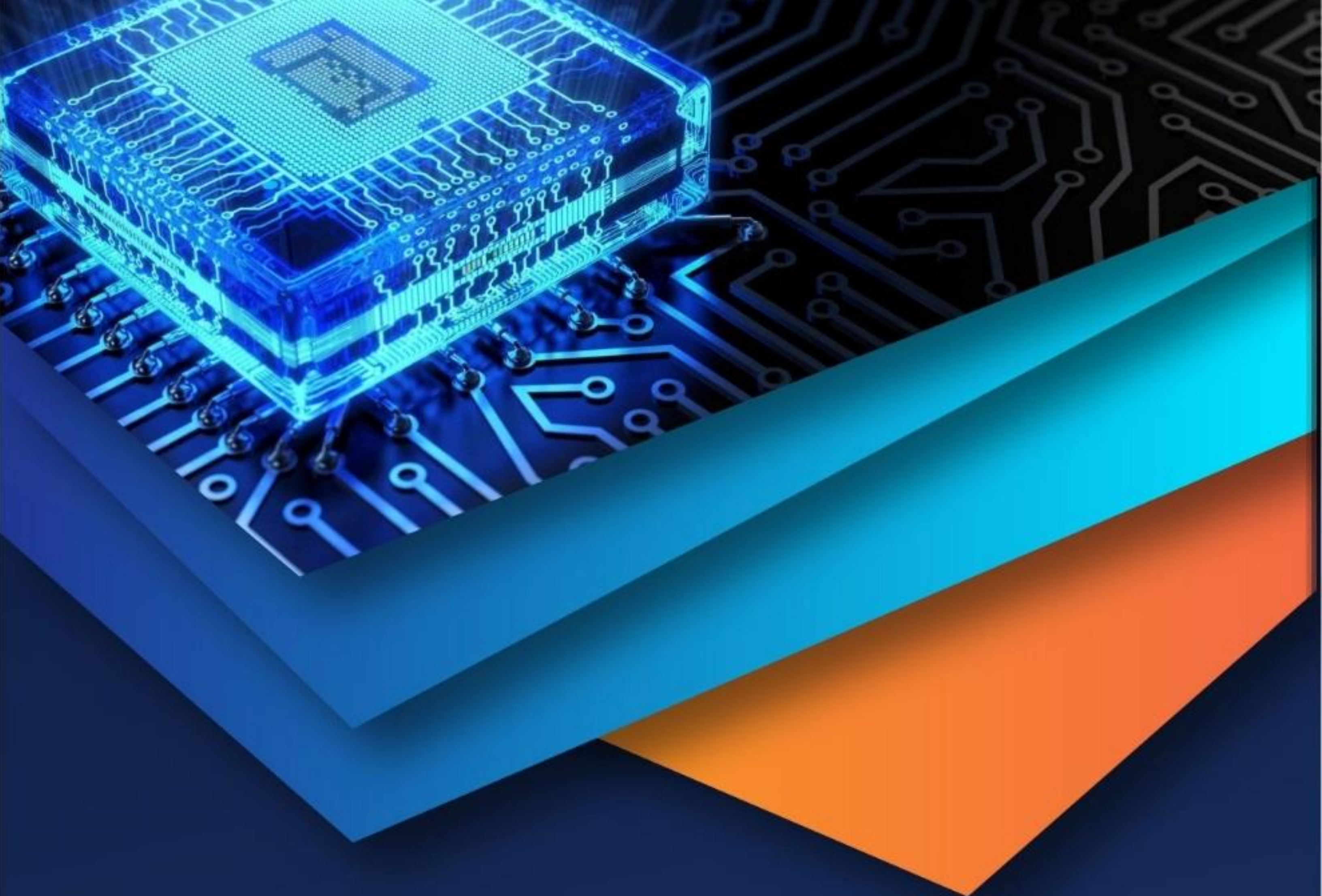
XIV. FUTURE WORK

In the future, the system can be improved in several ways to enhance performance and usability. One important improvement is to increase the dataset by including more genuine and forged certificate samples from different institutions and formats. This will help the model learn a wider variety of patterns and improve prediction accuracy. Another enhancement is the use of explainable AI techniques, which can show why a certificate is classified as real or fake. This will help users and organizations better understand the decision made by the system. The system can also be developed into a mobile application, allowing users to verify certificates directly using their smartphones, making it more accessible and convenient. Future versions of the system can incorporate advanced deep learning models such as Vision Transformers or improved architectures like Efficient Net to achieve better accuracy. Ensemble learning techniques, which combine multiple models, can also be used to improve prediction stability and reduce errors. Another important area is model optimization. Techniques such as quantization and pruning can reduce model size and improve speed, enabling the system to run efficiently even on low-power devices.

Integration with official databases and QR code verification systems can further strengthen authenticity checks. Additionally, the system can be enhanced with multilingual chatbot support and offline capabilities, making it useful in remote areas with limited internet access. With these improvements, the certificate verification system can become more accurate, secure, and widely accessible for real-world applications.

REFERENCES

[1] A. Krizhevsky, I. Sutskever, and G. E. Hinton, "ImageNet classification with deep convolutional neural networks," in Proc. Advances in Neural Information Processing Systems (NeurIPS), 2012.
[2] K. He, X. Zhang, S. Ren, and J. Sun, "Deep residual learning for image recognition," in Proc. IEEE Conf. Computer Vision and Pattern Recognition (CVPR), 2016, pp. 770–778.
[3] M. Tan and Q. Le, "EfficientNet: Rethinking model scaling for convolutional neural networks," in Proc. Int. Conf. Machine Learning (ICML), 2019.
[4] D. P. Kingma and J. Ba, "Adam: A method for stochastic optimization," in Proc. Int. Conf. Learning Representations (ICLR), 2015.
[5] R. Szeliski, *Computer Vision: Algorithms and Applications*. Springer, 2011.
[6] R. C. Gonzalez and R. E. Woods, *Digital Image Processing*, 4th ed. Pearson, 2018.
[7] T. Fawcett, "An introduction to ROC analysis," Pattern Recognition Letters, vol. 27, no. 8, pp. 861–874, 2006.
[8] J. Devlin, M. Chang, K. Lee, and K. Toutanova, "BERT: Pre-training of deep bidirectional transformers for language understanding," in Proc. NAACL-HLT, 2019.
[9] T. Mikolov et al., "Efficient estimation of word representations in vector space," in Proc. ICLR Workshop, 2013.
[10] I. Goodfellow, Y. Bengio, and A. Courville, *Deep Learning*. MIT Press, 2016.
[11] S. Agarwal and A. Singh, "Document forgery detection using machine learning techniques," International Journal of Computer Applications, vol. 182, no. 45, 2019.
[12] M. Sharma and R. Mehta, "Fake document detection using image processing," International Journal of Engineering Research & Technology, vol. 9, no. 5, 2020.
[13] P. Singh and N. Kaur, "Optical character recognition based document verification system," International Journal of Advanced Research in Computer Science, 2021.
[14] World Wide Web Consortium (W3C), "QR Code and Digital Verification Standards," W3C Reports, 2022.
[15] National Institute of Standards and Technology (NIST), "Digital Identity Guidelines," NIST Special Publication, 2023.



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