AINAT: Artificial Intelligence Attendance Terminal

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Abstract

Biometric authentication has revolutionized attendance tracking systems, offering a seamless and secure alternative to traditional methods. This paper introduces AINAT (Artificial Intelligence Attendance Terminal), a facial recognition-based system that enhances security, reduces manual workload, and eliminates common issues associated with fingerprint-based attendance systems. The study explores AINAT's architecture, working principles, implementation, and limitations, while also discussing real-world applications and future scope.

Keywords:

Artificial Intelligence, Face Recognition, Attendance System, Biometrics, AI Security.

I. Introduction

Traditional attendance systems rely on manual sign-ins or biometric scanners such as fingerprint recognition, which can be slow, inaccurate, and unsanitary. The emergence of AI-driven face recognition has significantly improved attendance marking processes. AINAT is designed to enhance security and efficiency through an AI-powered facial recognition system, leveraging deep learning models for real-time authentication.

II. Methodology

AINAT consists of a high-resolution binocular camera, an AI-based processing unit, and a biometric database integrated with a cloud-based attendance portal. The key components include Face

Detection Module, Face Recognition Model, Data Processing, and User Authentication.

III. Results and Discussion

AINAT was tested in an educational institution with 300 users. The results indicated a recognition accuracy of 97.2%, False Rejection Rate (FRR) of 2.8%, and False Acceptance Rate (FAR) of 1.5%. It was observed that AINAT improves accuracy and scalability while reducing security risks.

IV. Conclusion and Future Scope

AINAT presents a reliable, scalable, and efficient AI-based attendance tracking solution. Future improvements could involve 3D Face Recognition for enhanced accuracy, integration with IoT for remote access control, and Edge Computing for faster processing and reduced dependency on cloud storage.

References

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