Enhancing CCTV System With Two Factor Authentication

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This project develops a secure two-factor authentication system for access control using both face and voice recognition, ensuring that only users who match both biometric credentials can gain entry. By requiring face and customizable voice password verification, it effectively minimizes unauthorized access.

Acknowledgments and Contact Information

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Introduction

This project explores an enhanced security mechanism for CCTV/Doorbell systems through a two-factor authentication system combining face and voice recognition. In this setup, face recognition is performed first, followed by voice recognition, ensuring both factors must align for access to be granted.

Importance:

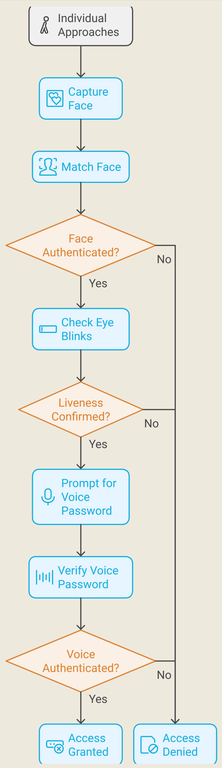
Incorporating both face and voice verification adds a robust layer of security, significantly reducing unauthorized access compared to single-authentication methods.

Architecture & Methods

Description:

The system's architecture includes a two-stage process:

1. Face Recognition Stage: This uses face detection to identify known individuals. Eye-blink detection is integrated to ensure liveness, preventing spoofing through static images.
2. Voice Recognition Stage: The voice recognition system authenticates the individual by recognizing a voice-based password. A neural network classifies the voice to determine access authorization.



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Discussion

Interpretation:

The integration of face and voice recognition strengthens security. The two-factor approach minimizes false positives and greatly reduces unauthorized access compared to either method alone.

Comparison:

Compared to single-factor authentication, this dual-system approach provides enhanced security by requiring both face and voice to match.

Future Directions:

Future research could explore the use of additional biometric factors (e.g., fingerprint or gait) to further secure access systems.

Objective

Integrate face and voice recognition to enhance access security, allowing entry only when both match predefined credentials to prevent unauthorized access.

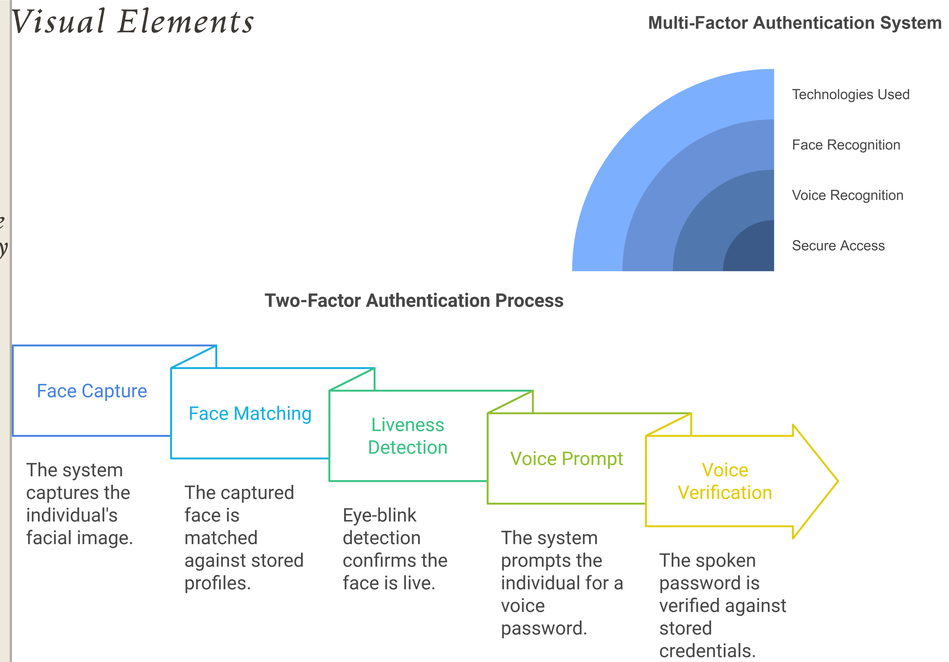
Procedures:

1. Face Recognition: Capture the face of an approaching individual and verify it against stored profiles.
2. Voice Recognition: Authenticate through a customizable voice password, detected via real-time speech recognition.

References

- *Citations:*
- *Smith, J. (2022). Biometric Authentication Techniques. Springer.*
- *Brown, A. & Lee, M. (2023). Advanced Face Recognition in Security Systems. IEEE Transactions on Biometrics.*

Visual Elements



Conclusion

This two-factor authentication system enhances security for CCTV/Doorbell access by requiring both face and voice validation. This dual-method approach significantly improves the reliability of access controls and reduces potential breaches.