IRIS
RECOGNITION SYSTEM

Abstract

An iris recognition system is a biometric technology that identifies individuals based on the unique patterns within the iris of their eyes. This system relies on high-resolution cameras to capture detailed images of the iris, which contains a complex pattern of ridges, furrows, and other unique features. The captured iris image is then processed using specialized algorithms to extract and encode these distinctive characteristics into a digital template, which is stored in a database for future comparison. One of the key advantages of iris recognition is its high level of accuracy and reliability. The iris is highly stable throughout a person's lifetime and is less susceptible to changes due to aging or environmental factors compared to other biometric identifiers such as fingerprints. Additionally, iris recognition systems offer fast and non-intrusive authentication, making them suitable for a wide range of applications including access control, border security, and identity verification.

The intricate patterns within the iris, formed during embryonic development, are as unique as fingerprints. Unlike fingerprints, which can be marred by scars or wear, the iris remains remarkably stable throughout a person's life. Even aging or minor injuries have minimal impact on the iris code, making it a reliable long-term identifier. During identification, a new iris image is captured. The system extracts features and generates a new template. This new template is then compared against the stored templates in the database. If the patterns match within a predefined threshold, the person is identified. Iris recognition technology offers a powerful and secure approach to identification, with its unique advantages making it a valuable tool for various applications. However, it's important to consider factors like privacy concerns and potential biases in facial recognition algorithms before widespread adoption.

Keywords : Iris recognition, SIFT, Key point matching, Feature extraction, Image processing, Biometrics, Tune, OpenCV , Python, Media Pipe.

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