Machine Learning-Based Iris Recognition Modern Voting System

1. Project Overview

This project implements a **modern voting system** using **iris recognition technology**. It leverages **machine learning** to authenticate voters based on **iris scans**, ensuring **secure, fraud-resistant, and efficient voting**.

2. Features

- **Secure voter authentication** using iris recognition
- **Machine learning-based iris pattern classification**
- **Real-time image processing and feature extraction**
- **User-friendly web interface for election management**
- **Prevents duplicate voting and identity fraud**

3. Tech Stack

- **Programming Language:** Python
- **Machine Learning:** OpenCV, TensorFlow/Keras
- **Database:** SQLite/MySQL
- **Web Interface:** Flask (Optional)
- **Image Processing:** OpenCV, Scikit-learn
- **Deployment:** Local or Cloud-based

4. Installation & Setup Guide

1. Clone the repository:

   ```
   bash
   CopyEdit
   git clone https://github.com/yourusername/iris-voting-system.git
   ```

2. Navigate to the project folder & install dependencies:

   ```
   bash
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   cd iris-voting-system
   pip install -r requirements.txt
   ```

3. Prepare the dataset for training (if applicable).
4. Train the ML model (if needed):

   ```
   bash
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   python train_model.py
   ```

5. Run the application:

   ```
   bash
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   python app.py
   ```

5. Codebase Structure

```
bash
CopyEdit
/iris-voting-system
  ├── dataset
  │   ├── train
  │   ├── test
  ├── models
  │   ├── iris_recognition_model.h5
  ├── src
  │   ├── feature_extraction.py
  │   ├── model_training.py
  │   ├── app.py
  ├── README.md
  ├── requirements.txt
  ├── .gitignore
```

6. Deployment Guide

- **Deploy Flask-based UI** on **Heroku/Vercel**
- Use **cloud-based database** for election data storage
- Ensure **proper security** for authentication and data protection

7. Future Enhancements

- **Integrate blockchain** for enhanced security
- **Improve model accuracy** using deep learning techniques
- **Extend to multi-biometric authentication** (fingerprint, face recognition)