Fake News Detector 📰- AI-Powered Verification System

An intelligent web application powered by **Machine Learning**, **Flask**, and **MongoDB** to detect and classify fake news articles in real time. The project includes a secure admin panel with OTP verification, a feedback-driven model retraining system, and an elegant UI experience.

🗜️Features

- 🔍**Real-time Prediction** of fake or real news articles
- 🔗**Feedback Collection** for user satisfaction (Yes/No)
- 📊**Admin Panel** with secure OTP-based login
- 🔐**Secure Email-based Access** for approved admin emails only
- 🧪**Model Retraining** using approved feedback
- 🕰️Live database with **MongoDB Atlas**
- 📧**Email Integration** using Flask-Mail & Gmail SMTP
- 📅Timestamped logs of predictions with confidence score
- 🕛Beautiful, responsive UI with animated visuals (waves, particles, fireflies)

🛠️Tech Stack

Component	Technology
Backend	Python, Flask
ML Model	Logistic Regression + TF-IDF
Database	MongoDB (Atlas)
Email Service	Flask-Mail (SMTP)
Frontend	HTML, CSS, JavaScript

📂Folder Structure

```
Fake-News-Detector/
├── Home.py                  # Main Flask server file
├── fake_news_pipeline.py    # ML model pipeline and retraining
├── templates/               # HTML templates
├── static/                  # CSS, JavaScript, Images
```

```
├── news_dataset.csv          # CSV dataset for training/retraining
├── .env                      # Environment variables (hidden)
├── requirements.txt          # Python dependencies
```

⚙️Setup Instructions

1. Clone the repository

```
git clone https://github.com/atribiswas03/fake-news-detector-ai
cd fake-news-detector-ai
```

2. Create and activate a virtual environment (recommended)

```
python -m venv .venv
source .venv/bin/activate  # On Windows: .venv\Scripts\activate
```

3. Install dependencies

```
pip install -r requirements.txt
```

4. Create a `.env` file

```
touch .env
```

Add the following:

```
MONGO_URI=your_mongo_uri
MAIL_USERNAME=your_email@gmail.com
MAIL_PASSWORD=your_app_password
MAIL_DEFAULT_SENDER=your_email@gmail.com
```

5. Run the app

```
python Home.py
```

Then open your browser and visit: `http://127.0.0.1:5000`

📈Admin Panel Features

- View logs of all predictions with confidence levels
- Approve or reject user feedback entries
- Automatically retrain model with approved samples
- Add/delete admin emails (admin-only)
- OTP-based secure login
- Delete single or all prediction logs

✉️Contact

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📄License

This project is open-source and available under the MIT License.

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IMPORTANT STEPS

1. Delete the following two files:
    a. **vectorizer.joblib**
    b. **model.joblib**
2. Run **fake_news_pipeline.py** in VS Code.
   (⚠ This may take a little time. After successful execution, it will automatically generate the above two files.)
3. Now run **Home.py**.
   The model will continue to improve over time based on user feedback and admin approval.
   Note : Proper training and consistent feedback help improve prediction accuracy.