User Manual: Gender Detection System

Gender Detection System - User Guide

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1. Introduction

The Gender Detection System is a web-based application designed to analyze **teeth radiographs** and determine the gender of individuals using an AI-powered **YOLOv11 model**. It provides insights useful for:

- **Dentists**
- **Forensic Experts**
- **Medical Diagnosticians**

The system allows users to: ☑ Upload radiograph images (single or batch).
☑ View gender detection results.
☑ Generate visual reports with confidence scores.
☑ Set reminders for follow-ups or reviews.

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2. System Requirements

Hardware:

- Minimum **4GB RAM** (8GB+ recommended)
- **CPU:** Intel i5 or higher (**GPU acceleration optional**)
- **Storage:** At least **5GB free space**

Software:

- **Python 3.8+**
- **Flask Web Framework**
- **Ultralytics YOLOv11**
- **OpenCV**
- **Matplotlib**
- **FPDF for Reports**

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3. Installation & Setup

Step 1: Install Dependencies

Run the following command to install required libraries:

```
bash
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pip install flask ultralytics opencv-python matplotlib fpdf werkzeug
```

Step 2: Download and Setup Model

Ensure your **trained model file (`best.pt`)** is placed inside the `models` folder:

```
bash
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/models/best.pt
```

Step 3: Run the Application

Navigate to the project directory and run:

```
bash
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python app.py
```

The system will start and be accessible at:

```
arduino
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http://127.0.0.1:5000/
```

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4. Using the System

📌 Uploading Images

1. Click on the **Upload Data** section.
2. Choose one or multiple radiograph images (JPG, PNG).
3. Click **Upload**.
4. The system will process the images and display:
    - Detected **gender**.
    - **Confidence score**.
    - **Detection visualization**.

📊 Viewing Detection Results

Once the images are processed:

- A **summary** of male vs. female detections will be displayed.
- **Low-confidence detections** will be flagged.
- A **graph visualization** of results will be generated.

📄 Generating Reports

1. After uploading images, navigate to **Reports**.
2. Apply filters:
    - Filter by **Male / Female**.
    - Set a **Minimum Confidence Score**.
3. Click **Download Report**.
4. A **PDF report** will be generated with:
    - Detection results.
    - Confidence scores.
    - A visual summary chart.

📅 Managing Reminders

1. Go to **Reminders**.
2. Enter:
    - **Task Description**
    - **Date & Time**
3. Click **Add Reminder**.
4. Active reminders will be displayed with a delete option.

⚙️ Updating Settings

1. Navigate to **Settings**.
2. Update:
    - **Email**
    - **Password**
3. Click **Save Changes**.

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5. Troubleshooting

Issue	Solution
Images not uploading	Ensure images are in **JPG/PNG** format.
Model not detecting gender	Ensure `best.pt` is in the correct location.
Report not generating	Check if results exist before clicking **Generate Report**.

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6. Frequently Asked Questions (FAQs)

Q1: Can I upload multiple images at once?
Yes, the system supports **batch processing** of multiple images.

Q2: Can I filter detection results?
Yes, in the **Reports section**, you can filter results based on **gender and confidence scores**.

Q3: What if the confidence is low?
The system **flags low-confidence detections**, allowing for **manual review**.
