AI MODEL DEPLOYMENT SUMMARY

Project Title: Mosquito Detection using YOLOv8

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1. Objective

To build an AI model that tracks mosquitoes using computer vision (YOLOv8) and deploy it as a standalone application (.exe) for offline use.

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2. Model Training

- **Model Used:** YOLOv8n (Nano Version)
- **Dataset:** Custom mosquito image dataset
- \~8,365 training images
- Properly annotated with `.txt` label files
- **Platform Used:**
- Trained using Google Colab with T4 GPU (for faster training)
- Model file generated: `best.pt`

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3. Local Deployment Plan

A. Build Python Application:

- Write a Python script (`mosquito_app.py`) that:
- Loads the trained YOLOv8 model (`best.pt`)
- Accepts webcam, image, or video as input
- Displays detection output in real-time using OpenCV

B. Convert to EXE:

- Use **PyInstaller** to create standalone executable:

```
pip install pyinstaller
pyinstaller --onefile mosquito_app.py
```

- Output file:

```
dist/mosquito_app.exe
```

- Ensures that `.exe` runs on any Windows system without requiring Python

C. Offline Usage:

- The `.exe` and `best.pt` model are packaged together
- Can run without internet, using built-in webcam or video files

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4. Key Benefits

- Offline, fast mosquito detection
- Easy to share and run on any Windows PC
- Fully trained AI model without needing cloud or server

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5. Optional Extensions

- Add tracking with ByteTrack or DeepSORT
- Deploy to web using Streamlit or Gradio if internet required
- Real-time alert systems (buzzer, Arduino integration)

Status:

Model trained and verified ✅ `.exe` application pending final testing and packaging