GobyFinder GUI Instruction Manual

Overview

The GobyFinder GUI is a tool for running YOLO-based inference on images. It allows users to configure settings, select models, and process images through an easy-to-use interface.

Prerequisites

Python Installation: Ensure Python 3.8 or higher is installed on your system. You can download it from https://www.python.org/downloads/.

Setting Up the environment with windows batch file

Create the Virtual Environment on windows:

- Double click the `create_venv.bat` which is a windows batch file script with full instructions that will install the virtual environment:

After clicking this batch file

- A command prompt window should pop up showing the packages being installed.
- A virtual environment called Gobyfinder will be storied in the `GobyFinderEnv` folder.
- The installation will take 10 to 15 minutes depending on the setup.

Manual installation of the environment

Make sure to install the GobyFinder environemnt in the same folder as the exe

- python -m venv GobyFinderEnv
- source GobyFinderEnv\Scripts\activate
- python -m pip install ultralytics shapely

For running gpus on windows machines that need cuda 11.8 specific cuda drivers

- python -m pip uninstall -y torch torchvision
- python -m pip install torch torchvision torchaudio --index-url https://download.pytorch.org/whl/cu118

Using the GUI

Text fields

Image Directory: Click "Browse" to select the folder containing the images you want to process.

- Note: If you have associated labels, please follow the directory guidelines.

Model (.pt): Click "Browse" to select the trained YOLO model weights file (`*.pt`) for inference.

Output Name: Specify the name of the output file (e.g., `results_2025`).

Batch Settings

- Set "Batch size" to control the number of images processed per batch.
- Set "Starting batch" to resume processing from a specific batch.
    - Note: If you plan to do a large inference run and need to pick up where you left off, you have to keep the batch size the same for the entire run.

Confidence Threshold: Set the minimum confidence for predictions usually ranges from 0.2 to 0.5.

Image Size: Specify the longest pixel dimension of the images used during training (e.g., 3008 for GoPro images and 2048 for auv images).

Radio Button Options

Save image overlays: Check to save annotated images.

Has YOLO object labels: Check if your images have YOLO label ground truths.

- Note: must be saved in a folder caled "labels".

"Has quadrat cage labels: Check if your images have quadrate cages labeled for each image.

- Note: must be saved in a folder called "cages" next to "images".

Optional checks

3. **Check CUDA (optional)**: Click "Check CUDA" to verify if a CUDA-compatible GPU is available.
4. **Test YOLO (optional)**: Click "Test YOLO" to run a mock inference test and verify the setup.

Execute YOLO Inference

5. **Run Inference**: Click the "Run Inference" button to start processing images. The console output will display progress and logs.

Directory Guidelines

The GobyFinder GUI executable is programmed to look in its current directory for the environment. Ensure the folder structure is as follows:

```
Folder
├── GobyFinderEnv
│   ├── ...
├── GobyFinder.exe
```

Image and label directories should be stored together in the same folder, and the label files must have the same name as their associated images. Use the following structure:

```
Folder
├── images
│   ├── file1.png
│   ├── file2.png
│   ├── ...
│   ├── fileN.png
├── labels
│   ├── file1.txt
│   ├── file2.txt
│   ├── ...
│   ├── fileN.txt
├── cages
│   ├── file1.txt
│   ├── file2.txt
│   ├── ...
│   ├── fileN.txt
```

This structure ensures proper functionality of the GobyFinder GUI.

Troubleshooting

Environment Not Found: If the GUI shows an error about the environment, ensure you have run `create_venv.bat`.

Manual environment troubleshooting guidance

Launch command prompt: windows --> cmd

Activate the Virtual Environment: If the virtual environment was created, activate it by typing the path to the activation script in cmd:

```
GobyFinderEnv\Scripts\activate
```

Verify the Setup: Check that the required dependencies are installed. Ensure packages like `torch`, `torchaudio`, `tkinter`, and others are listed.

```
python -m pip list
```

Missing Dependencies: If a dependency is missing, like torch, install it manually:

```
python -m pip install <package-name>
```

CUDA Issues: If CUDA is not detected, ensure the correct drivers and CUDA Toolkit are installed. You can also run inference on the CPU by ensuring `torch` is installed without GPU support.

File Not Found Errors: Ensure the paths to the image directory, model file, and output file are correct.

Logs and Debugging

Logs:

- Errors are logged in `error_log.txt`.
- All other terminal output including YOLO and batch progress are saved in `log.txt`.

Debugging: If the GUI crashes or behaves unexpectedly, check the logs for details and ensure all prerequisites are met.

Exiting the GUI

To exit the GUI, simply close the application window.

Additional Notes

- If the cuda checks or YOLO test continues to fail, try to delete and re-install the environment.
- For large datasets, adjust the batch size to balance performance and memory usage.
- For further information on the model, refer to the Ultralytics documentation on YOLOv8.