Release Notes for Car Windshield Defect Detection App Version 1.0.0

We are excited to announce the release of our new Car Windshield Defect Detection App! - An app fully built and deployed in python. This app utilizes the power of Deep Learning models to automate the process of identifying defects in car windshields.

App Components

Server Used: Streamlit Cloud

Database: None

User Interface: Streamlit & Hydralit Components

Tech Stack

1. Streamlit (for User Interface development and app deployment)
2. Ultralytics YOLOv8 (for model training)
3. XlsxWriter (for generating excel reports)
4. OpenCV (for reading and processing input images from user)
5. Hydralit Components (gives streamlit templates for the app User Interface)

Setup

NOTE: The below instructions assume that a valid Python version (>=3.9) is already installed on the user's system, with its path already added to the environment variables.

Step-1: The dataset containing 500 images of cracked car windshields along with their labels can be found here. Download the dataset in the C-drive.

Step-2: Clone the following github repository locally for the source code of the app and yolo training code.

Step-3: After downloading the source code, extract it to any location in your system. Go to that location in cmd prompt and type the following:

pip install -r requirements.txt

This will install all the required dependencies to run this app locally.
Step-4: Now open app.py file locally. Go to the location it is stored in cmd prompt and type the following command:

streamlit run app.py

To run the above app locally.

Key Features and Improvements

Here are the key features and improvements in this release:

1. **Automated Defect Detection**: - Our app employs state-of-the-art Deep Learning models to automatically analyze car windshields for defects. - This eliminates the need for manual inspection, saving time and reducing the subjectivity of the process. - The app quickly scans newly manufactured windshields and provides immediate predictions on their defectiveness.

2. **Improved Accuracy:** - By leveraging advanced image recognition techniques, our models achieve higher accuracy in detecting defects. - This ensures that even subtle or non-visible defects can be identified, depending on the dataset used to train the models. - The app's predictions are reliable and help maintain the quality of manufactured parts.

3. **Streamlined Manufacturing Process**: - With the implementation of our app, the manufacturing process is significantly sped up. - By automating defect detection,

manufacturers can meet customer demands at a faster pace. - This leads to increased efficiency and productivity, reducing delays and improving overall customer satisfaction.

4. **Minimized Customer Complaints**: - By accurately identifying defects in car windshields, our app helps minimize customer complaints. - Manufacturers can ensure that only high-quality windshields are delivered to customers, enhancing their trust and loyalty.

5. **User-Friendly Interface**: - Our app is built using Streamlit, providing a user-friendly interface for easy navigation and interaction. - The intuitive design allows users to effortlessly upload windshield images and receive instant defect predictions.

Future Plans

We are committed to continuously improving our app and providing the best experience for our users. In future releases, we plan to incorporate additional features such as defect classification and detailed defect analysis.

Thank you for choosing our Car Windshield Defect Detection App. We hope it enhances your manufacturing process and contributes to producing flawless car windshields.

Happy defect detection!