Project Documentation: Multipara Monitor Data Interpretation

Objective

The primary goal of this project is to develop a software solution capable of interpreting data from multipara monitors using a video feed. The system should demonstrate adaptability across various monitor models, ensuring versatility and applicability.

Tech Stack

The chosen technology stack for this project includes:

- **Python:** The core programming language facilitating overall development.
- **OpenCV:** Employed for computer vision tasks, particularly in the detection and localization of critical data areas on different monitor screens.[yolo -> trained my own model]

Project Structure

Detection of Data Display Areas

- **Objective:** Identify critical data areas, encompassing metrics such as HR (Heart Rate), ECG (Electrocardiogram), and oxygen levels, across a spectrum of monitor screens.
- **Implementation:** Leverage OpenCV's computer vision capabilities to detect and precisely locate the relevant display regions on monitors with varying layouts and designs.

Data Categories and Names

- **Data Categories (nc):** 9
- **Names:**
    - DBP (Diastolic Blood Pressure)
    - HR (Heart Rate)
    - HR_W (Heart Rate Waveform)
    - MAP (Mean Arterial Pressure)
    - RR (Respiration Rate)
    - RR_W (Respiration Rate Waveform)
    - SBP (Systolic Blood Pressure)
    - SPO2 (Oxygen Saturation)
    - SPO2_W (Oxygen Saturation Waveform)

Video Overview

Introduction to Small Dome Dam Project

- The video starts with a comprehensive introduction to the Small Dome Dam project, emphasizing the activation of the development environment using Python.

Functionality Demonstration

- A detailed walkthrough of the basic User Interface (UI) is provided, showcasing the core functionality where users can select a file, be it a video or an image, for further processing.

Image Processing

- The video demonstrates the process of choosing an image, uploading it, and allowing the model to predict critical elements like HR and SPO2 within the image.

Video Processing

- A processed video is presented, highlighting the positive results achieved in detecting complex metrics such as ECG and SPO2. The demonstration emphasizes the model's accuracy in various scenarios.

Key Metrics

- The presenter highlights key metrics, including a precision score of 0.86 for one parameter and 0.92 for another, underlining the reliability of the developed model.

Conclusion

- The video concludes with the presenter expressing satisfaction with the achieved results and hinting at the forthcoming detailed results, creating anticipation among the viewers.

Action Request

- The viewers are not explicitly requested to take any specific action, ensuring a passive conclusion to the video.

UI and Model Overview (Reference Video)

- A supplementary video focuses on the User Interface (UI) aspect of the project. It provides a deep dive into the end user's perspective, elucidates the code structure, explains navigation and router functionality, and offers demonstrations of model activation, image processing, and result showcasing.

Conclusion

This detailed documentation offers a comprehensive insight into the multipara monitor data interpretation project. It covers project objectives, the technology stack used, specific tasks undertaken, data categories, and a thorough breakdown of the referenced videos. It serves as a comprehensive guide for developers, project managers, and stakeholders involved in the development and deployment of this innovative solution.

There are some metrices I want to present precision,recall map metrics,confusion matrix and graph :

```
               all         25        169       0.93      0.958      0.941      0.708
499/499      12.6G  0.006955  0.008852 0.0002246    0.01523         48        640
             Class     Images     Labels          P          R     mAP@.5
               all         25        169       0.93      0.958      0.941      0.709
               DBP         25         15          1      0.938      0.998      0.742
                HR         25         24      0.958          1      0.978      0.832
              HR_W         25         25       0.92       0.92      0.877      0.598
               MAP         25         13      0.927          1      0.982      0.692
                RR         25         25      0.999          1      0.998      0.786
              RR_W         25         20       0.76       0.95      0.888      0.648
               SBP         25         15      0.998          1      0.998      0.797
              SPO2         25         16      0.997          1      0.998      0.825
            SPO2_W         25         16      0.812      0.812      0.748      0.464
Optimizer stripped from yolov7/run1/weights/last.pt, 74.9MB
Optimizer stripped from yolov7/run1/weights/best.pt, 74.9MB
wandb: WARNING Artifacts logged anonymously cannot be claimed and expire after 7 days.
```