PROGRESS REPORT FOR AQUAPHOTN'S MEGATRAINING PROJECT 25

Heading

Date: 8/13/2024

To: Aquaphoton Academy

From: Amr Zeina, Ibrahim Ismail, Mahmoud Morsi, Mohamed Yousry, Yassin Khaled.

1- Introduction

1.1 Purpose

We are developing a project that involves creating a remotely operated car, integrated with a Graphical User Interface (GUI) for user interaction and control. Additionally, the project incorporates advanced computer vision tasks to enable the car to perceive and respond to its environment intelligently.

1.2 Accomplishments

• Firmware and hardware: We have developed the Arduino IDE code and design on Tinkercad, but it is not yet complete because we haven't integrated the GUI. Additionally, we have created our own schematic symbols and footprints needed for the PCB design. We have scheduled a meeting for 10 PM to finalize a date for purchasing components tomorrow.

• Software: (Mohamed Yousry): worked on video stitching process algorithm using openCV library to process video frames using cv2.stitcher_PANORAMA (may use another stitcher later) and also working on improving and speeding up the frame processing by using multi CPU threading

refrences

- https://pyimagesearch.com/2016/01/25/real-time-panorama-and-image-stitching-with-opencv/ , https://stackoverflow.com/questions/68323829/video-stitching-using-open-cv

- https://docs.opencv.org/3.4/d8/d19/tutorial_stitcher.html

Scope

Task1: Amr Zeina and Ibrahim Ismail will collaborate on the design and development of the PCB for the project.

Task2: Mahmoud Morsi and Yassin Khaled will be responsible for implementing the firmware, ensuring seamless integration with the PCB work carried out by Amr and Ibrahim.

Task3: Mohamed Yousry will focus on the computer vision tasks, developing and refining algorithms to meet project requirements.

Task4: The GUI development tasks will be distributed among the team members, allowing for collaborative effort in designing an intuitive and functional user interface.

2- Status

2.1 Challenges Faced

- Firmware:We are developing ide code for a car with two modes of operation: manual and automatic ,there was some confusion to do that with three speed levels but After conducting extensive research, we succeeded in implementing this.We are also creating a Tinkercad design to test our code on it.
- Software: delay in output stitched video between every frame processing per second (low FPS) which I solved by using CPU multi-processing and cv2.Stitcher_PANORAMA which is faster than the defeault stitch

3- Conclusion

3.1 Assessment

The team is highly enthusiastic about starting the project, and our collaborative spirit is evident. The meeting was exceptionally productive, with valuable contributions from all members, setting a positive tone for our collective effort.

3.2 Contact

If you have any questions feel free and do not hesitate to contact us on the WhatsApp group.