PROGRESS REPORT FOR
AQUAPHOTN'S MEGATRAINING PROJECT 25

Heading

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To: Aquaphoton Academy

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1-Introduction

Today, we made significant progress in the hardware firmware and software development of our Aquaphoton mega project. Here is a brief update on our accomplishments and upcoming tasks.

2-Scope

- Hardware (Ibrahim Ismail & Amr Zeina):

  We meet and bought the components and printed the PCB layout to check the foot prints for the Created components

  Started making a simulation for the circuit in Proteus to check the circuit added some protections

  We Scheduled an offline meeting tomorrow in which we are going to test the whole circuit on a bread board before the PCB fabrication

- Firmware:

  We have designed a GUI interface for controlling our car,our gui contains labels and push Butttons to control mode of operation and we also added indicators that change their color when choosing speed level and mode, we have begun implementing the functionality to integrate our Arduino IDE code with the GUI code.

- 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

3-Status

Challenges Faced

- Hardware: The Foot print for 2 components was not accurate although they were created exactly as the data sheet dimensions

- 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

- Firmware: During the development of the GUI, we had a lot of challenges, such as determining how to create icons and how to change their color and facing difficulties in their integration. Presently, we are continuing to explore methods to effectively merge our Arduino IDE code with the GUI code.

4-Conclusion

In summary, we have made considerable strides in both hardware and firmware development. With our scheduled offline meeting tomorrow, we aim to further validate our circuit design before proceeding with PCB fabrication.