PROGRESS REPORT FOR AQUAPHOTN'S MEGATRAINING PROJECT 25

Heading

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To: Aquaphoton Academy

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1-Introduction

Overview of Today's Progress We have developed the Arduino IDE code and design on Tinkercad, Started the integration of the GUI. Additionally, A lot of progress in The schematic and component creation . We have scheduled an offline meeting for 14:00 for purchasing components and testing the method of programing the ATMega 328 p tomorrow.

2-Scope

- Hardware (Ibrahim Ismail & Amr Zeina):

  The whole schematic for the circuit and all the component has been created the foot print and the symbols for them

- Firmware:

  We have designed a GUI interface for controlling our car,our gui contains labels and push Butttons to control mode of operation, speed and also directions in manual 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: while creating the footprint we didn't find 3D model for the components some of them we made it with solid and only two is left without 3D model
- 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 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

Significant progress has been made in both hardware and software development. The schematic and component footprints are nearly complete, with minor issues remaining. The GUI design is underway, and video stitching performance has been finished using OpenCV. An offline meeting is scheduled for finalizing component procurement and testing the ATmega328P programming method.