Sensing The World

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SUMMER UNDERGRADUATE RESEARCH FELLOWSHIP

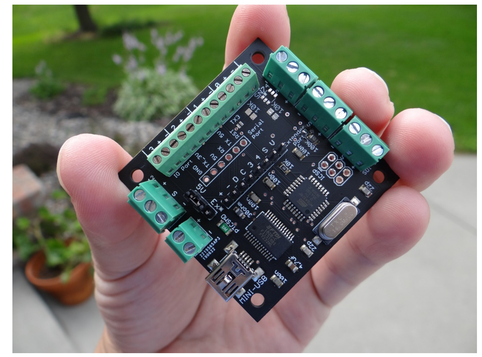
Martini Research Group

The group conducting this project was undergraduate researcher Samuel Leventini, graduate student Azhar Vellore, MD, and PI Dr. Ashlie Martini, PhD. The group worked together in the Martini Tribology Research Group

Martini Research Group

The Beginning

In experiments where chemicals or other such substances may be used that can potentially affect oxygen levels in a confined space, it is important there is some safety measure installed in order to safely conduct testing where the researcher is not at risk. This project utilizes a premade script from Dr. Liu's blog regarding data acquisition, especially with his raspberry pi's, and configured the script to work with the sensor installed in the lab. Edits made included eliminating unnecessary printing measurements such as website URL's, while instead printing out current oxygen and temperature levels at each iteration. At the end of the program, a graph was printed as a summery of the time and measurements taken while the code was running.



The Process

The project was undertaken remotely due to the COVID-19 pandemic. Each researcher conducted testing within the confines of their own home in order to follow quarantine rules.

The code was able to function because while the sensor did record other measurements besides oxygen and temperature, the recordings were compiled in a list, which we were able to then select only the data needed by calling specific indices based on location, and then had the code return the necessary values when prompted.

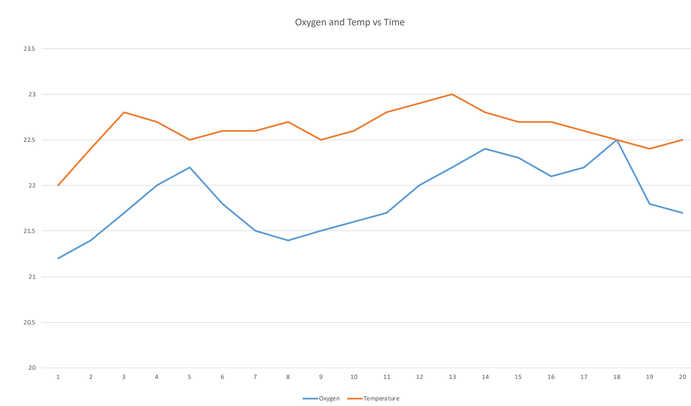
The End Result

We successfully configured the code to display only the current oxygen and temperature levels, and display a graph detailing all the measurements recorded during the testing session. The script has notes able for other users in the labs to make edits if necessary, in the future, as well as provide explanations for why certain lines of code are written and displays the systematic logic of the code itself.

Plans for the Future

One idea for the future that has been discussed to input some commands into the script to acknowledge when a drop in oxygen level has reached steady state, and record measurements only during that time. For this case, we would be examining only steady state conditions rather than any condition during testing.

The other topic that has been discussed, but not as much sure where to go, is to improve the efficiency of the code. The code begins to slow down after many such iterations, and we are still researching solutions to this issue. Although it does not compromise the project, it still would be beneficial to pursue this in the future.



This is an EXAMPLE of the graph produced

Acknowledgements

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