

ChickEEn Monitor

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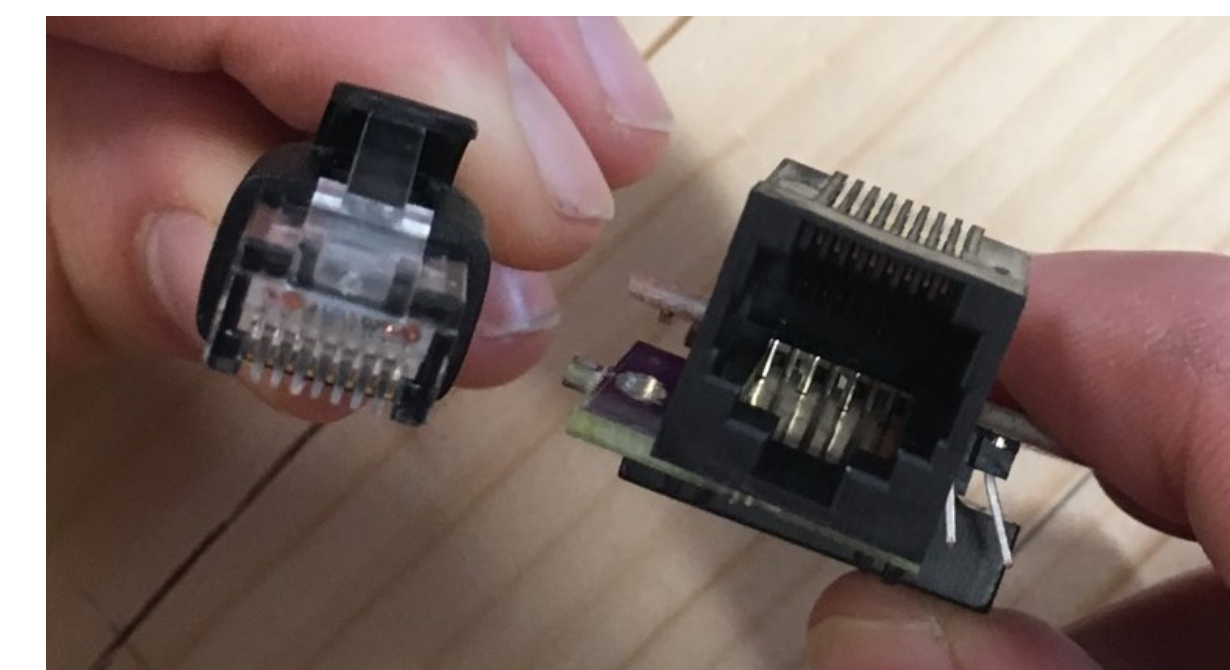


Summary

On the UC Davis campus, there is a chicken coop used for housing of chickens that lay eggs. With this chicken coup, there are a couple of problems that we plan to address through our electronic systems. The first problem that needs to be addressed is how to best keep track of the chickens as they enter and leave the chicken coup. Chickens are unpredictable in how they move about so it is difficult to predict the patterns with which they go in and out of the chicken coup without a specific tracking scheme in place. Due to this, it is hard to keep track of chickens when they are lost from the coop and do not return. A tracking system would help keep track of how many chickens are in the coop at a given time and if the number of chickens is decreasing over a period of time. In addition, it is desirable to keep track of certain characteristics of the chicken coop such as the temperature, humidity, and ambient light. It is necessary to keep track of these characteristics in order to make sure the chickens are kept in a climate that is suitable for their living habits.

Methodologies

Our chicken counter was tested and verified by setting up the system on a wooden frame that was an analog to the chicken coop entrance. Our tags were then placed on an analog of the chicken in order to make sure that the counter could count the tags as they walked into and out of our coop. Through this, it could be verified from the SD card data that the correct chickens were being recorded as well as whether they were walking in or out of the coop.

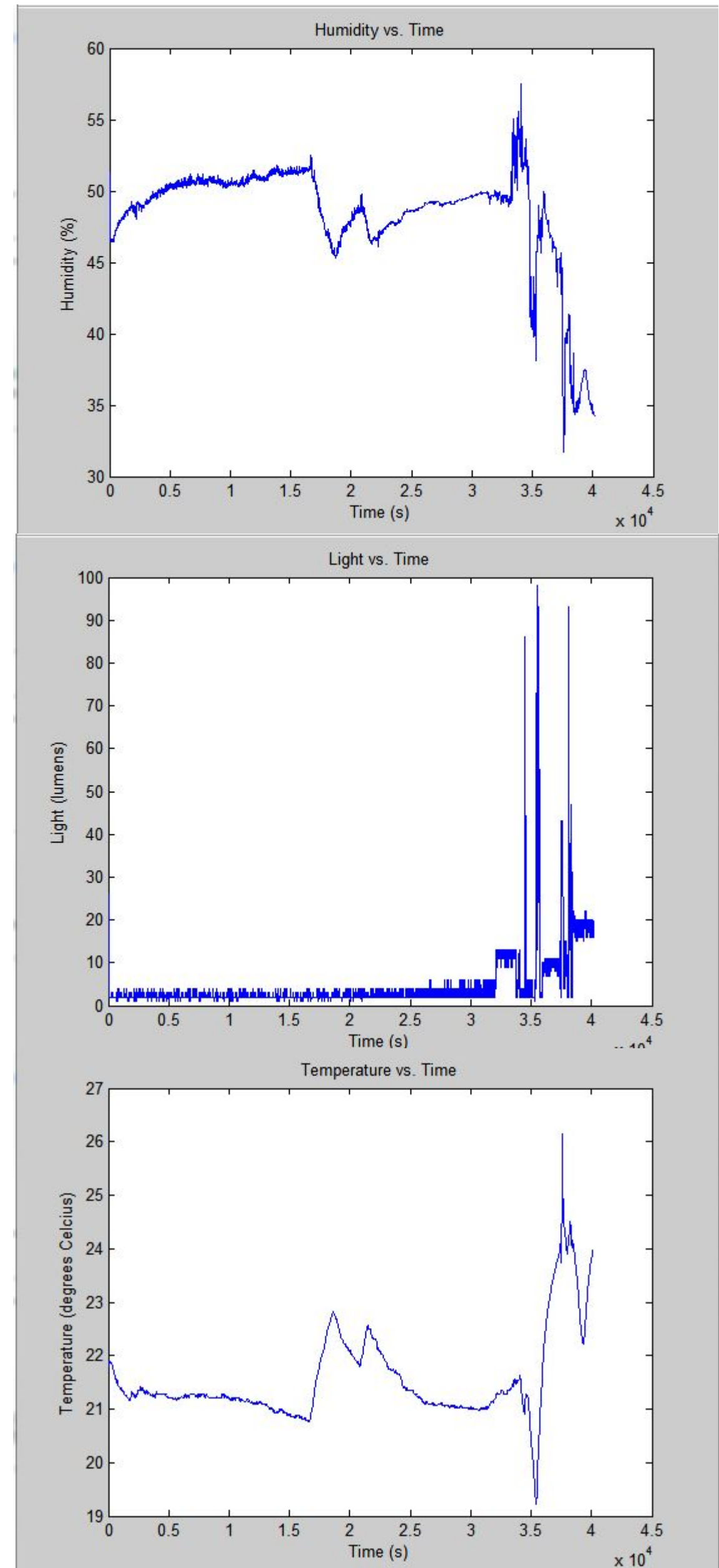


CAT6 connectors

RFID reader and IR Emitter

Results

Our project was able to implement both the environmental monitor and chicken counter parts of our project. Our environmental tracker has been shown to be able to successfully measure the humidity, temperature, and light of the environment (graphs right). This device could be used in many applications beyond a chicken coop in order to monitor the ambient environmental conditions. We have a Matlab script that will generate the graphs from the raw data so that the researchers can easily see any correlation between ambient environmental conditions and coop exit and entering behavior.



Our chicken counter can be used to track chickens as they walk past and keep track of both the ID of the chicken moving in and out of the coop, as well as the total number of chickens moving in and out of the coop. Below you can see some of the data collected during part of the field deployment. During this time we would force chickens to walk through the entrance to test the IR/RFID trip counter mechanism.

```
# Chickens in Coop: 01 id: 8AE660 IN Date: 00/00/00 00:50:43
# Chickens in Coop: 02 id: 8AE660 IN Date: 00/00/00 00:50:46
# Chickens in Coop: 03 id: 8AE660 IN Date: 00/00/00 00:50:49
# Chickens in Coop: 04 id: 751862 IN Date: 00/00/00 00:51:27
# Chickens in Coop: 03 id: 751862 OUT Date: 00/00/00 00:52:34
# Chickens in Coop: 02 id: 8AE660 OUT Date: 00/00/00 00:52:50
# Chickens in Coop: 03 id: 8AE660 IN Date: 00/00/00 00:53:07
# Chickens in Coop: 04 id: 8AE660 IN Date: 00/00/00 00:53:29
# Chickens in Coop: 05 id: 8AE660 IN Date: 00/00/00 00:53:35
# Chickens in Coop: 04 id: 8AE660 OUT Date: 00/00/00 00:53:41
# Chickens in Coop: 05 id: 8552DB IN Date: 00/00/00 00:54:31
# Chickens in Coop: 04 id: C7FE35 OUT Date: 00/00/00 00:56:56
```

Hardware



Vishay TSOP34338 Infrared Receiver



Osram SFH 4045N Infrared LED



Sparkfun ID-12LA RFID Kit



Honeywell HIH6030 Temperature/Humidity Sensor

Mobile Application

Our mobile application displays the current data being collected by the device (the same data that is being stored on the micro SD card). The most interesting part of this application is its ability to switch BLE connection. Since we have two devices with BLE (data logger and chicken counter), we had to develop a way to connect to one, read the data, disconnect, and then connect to the other.



Acknowledgements

We would like to thank Professor Niemeier, Professor Knoesen, Nick Madrid, and Jonathan Marrs for all of their help and guidance in completing this project. We would also like to thank Texas Instruments and Cypress Semiconductor for donating to our project.

