Ice Arena Temperature Control

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I. **Abstract**

Ice Arena Temperature Control is used to measure Temperature and Humidity for Ice Arena, Kent State University. It gives real time visualization in form of Google Charts and Google Maps.

II. **Introduction**

In Ice Arena Temperature Control two DHT11 sensors are used. DHT11 is used to measure Humidity and Temperature. This is a digital sensor. DHT11 sensor is used to measure the inside and outside's Temperature and Humidity of Ice Arena. The one wire is used to measure the Temperature of Ice. Photo Resistor is used to give idea about day and Night. Moreover, it gives alerts in form of SMS if either Temperature, Humidity, or Ice Temperature goes beyond the limit. The visualization is done in form of Google Charts and Google Maps.

III. **Model and Methodologies**

This system consists of five components which is described as below:

(i) Weather Arduino

The Weather Arduino will use DHT11 that display the measured reading of Temperature and Humidity level of outside the Ice Arena. The Photo Resistor is used to give idea about day and Night. As the Photo Resistor gives result in range of 0-5. If output display range 0-3 then it will consider as Day and if the output display range 3-5 then it will consider as night.

(ii) Weather Forwarder

The collected data of DHT11 sensor and Photo Resistor is sent to forwarder. The Forwarder then upload those data on stream named 'Ice_arena'. The measured Temperature is in Fahrenheit unit.
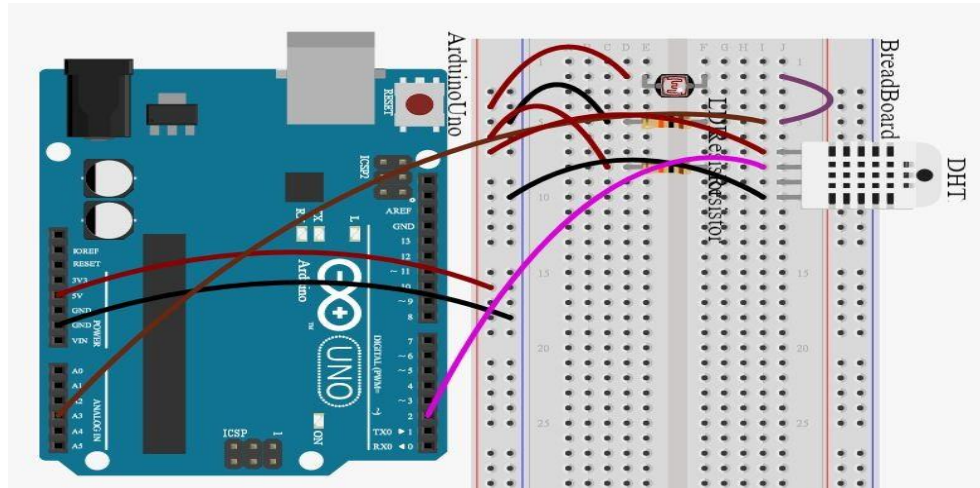
Fig. Weather Circuit Diagram

(iii) Ice Arena Arduino
The Ice Arena Arduino will use DHT11 that display the measured reading of Temperature and Humidity level of inside the Ice Arena. The one wire is used to measure the Temperature of Ice. Photo Resistor is used to give idea about day and Night.

(iv) Ice Arena Forwarder
The data of Temperature and Humidity collected by DHT11 and the Ice Temperature data collected by one wire are passing to the forwarder. The Forwarder further uploads those data on stream named 'Ice_arena'.
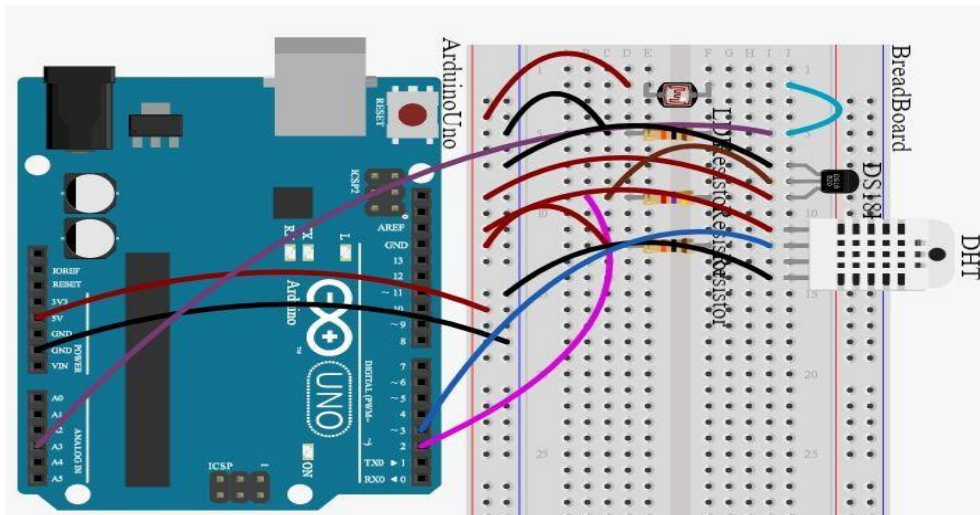

Fig. Ice Arena Weather Circuit Diagram

IV.   **Result**

Ice arena temperature control is an effective way to measure temperature and humidity in Ice Arena. For visualization of collected geo-tagged data we used chart and map. Below are results from web application. All temperature readings are in Fahrenheit.
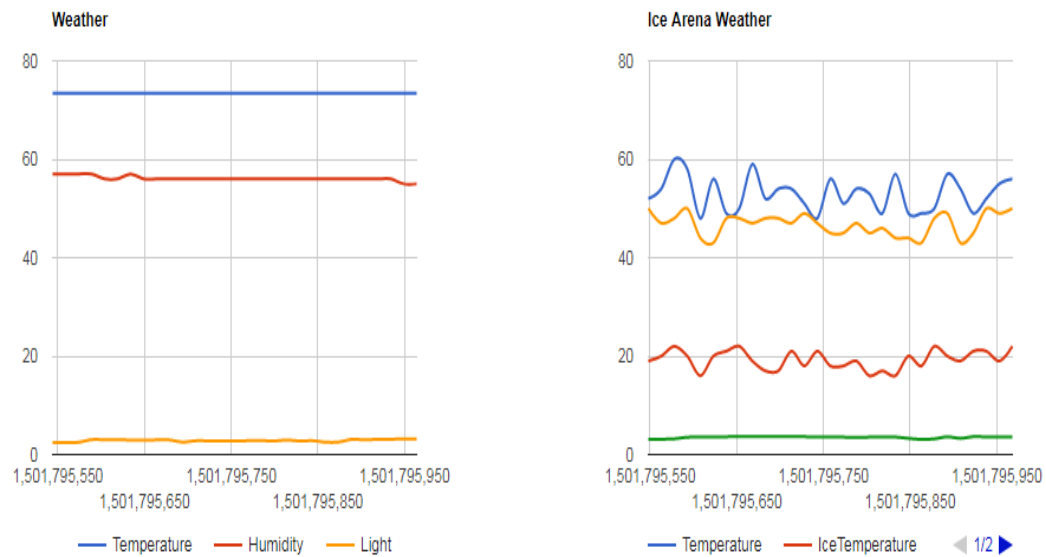

Fig. Weather outside and inside Ice arena using Google Chart

Left chart displays general weather outside of Ice arena in terms of Fahrenheit temperature and humidity. Right chart displays weather inside Ice arena. We used 4 real readings to generate dummy data from that and all results are displayed through dummy data.
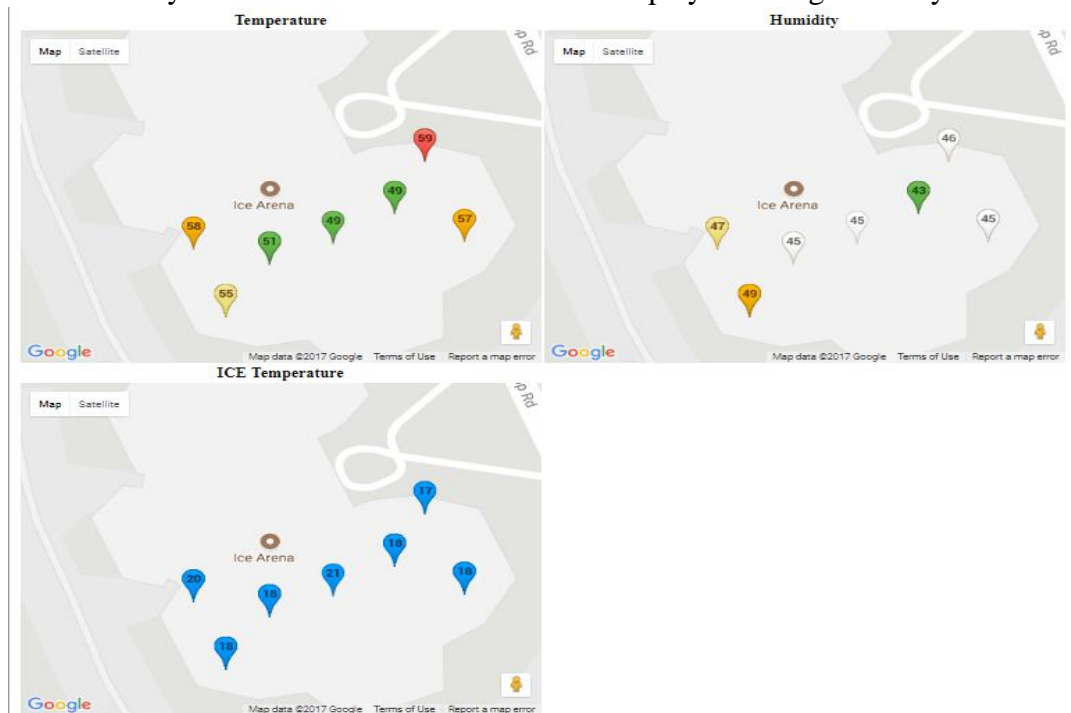

Fig. Weather inside Ice Arena using Google Maps

As shown in figure Google Maps used to display temperature, humidity, and Ice temperature inside Ice arena.

V. **Conclusion & Future work**

Ice Arena Temperature Control is very interactive and cheap and effective way to measure weather inside Ice Arena. By using dew point and ice thickness sensor the performance of Ice Arena Temperature Control can be enhanced.

VI. **Team participation**

As my project is in team, my participation in this project is as follows:
I worked on Weather circuit, Weather forwarder, Google Charts, GitHub, and Report.

VII. **References**

Source Code: https://github.com/bhavybhut/ice_arena
Project Link: https://bhavybhut15.pythonanywhere.com/