Portfolio Element 2 – Collecting and Presenting Sensor Data

Description of the technology

In this section, the technology of collecting and presenting sensor data is developed and demonstrated. To be more specific, I have followed and practiced the tutorial of using ThingSpeak to collect, visualise and analyze Internet of Things data, which is from sensors and cloud-based architecture applied for Smart Home, Smart City and Smart Environment. ThingSpeak is an open-source Internet of Things application and API to store and retrieve data from things using the HTTP and MQTT protocol over the Internet or via a Local Area Network (Thingspeak, 2021).

Citation for tutorial

Citation: (Mathworks, 2021)

Title: "Get Started with ThingSpeak"

Link:

https://au.mathworks.com/help/thingspeak/getting-started-with-thingspeak.html?s_tid=CRUX_lftnav

Output of that tutorial

After competing this tutorial, I have learned the basic knowledge and skills on how to collect the sensor data from REST API provided by a third-party authority or organization. Additionally, presenting collected sensor data in the form of visualizations is also contained.

Demonstration of ability

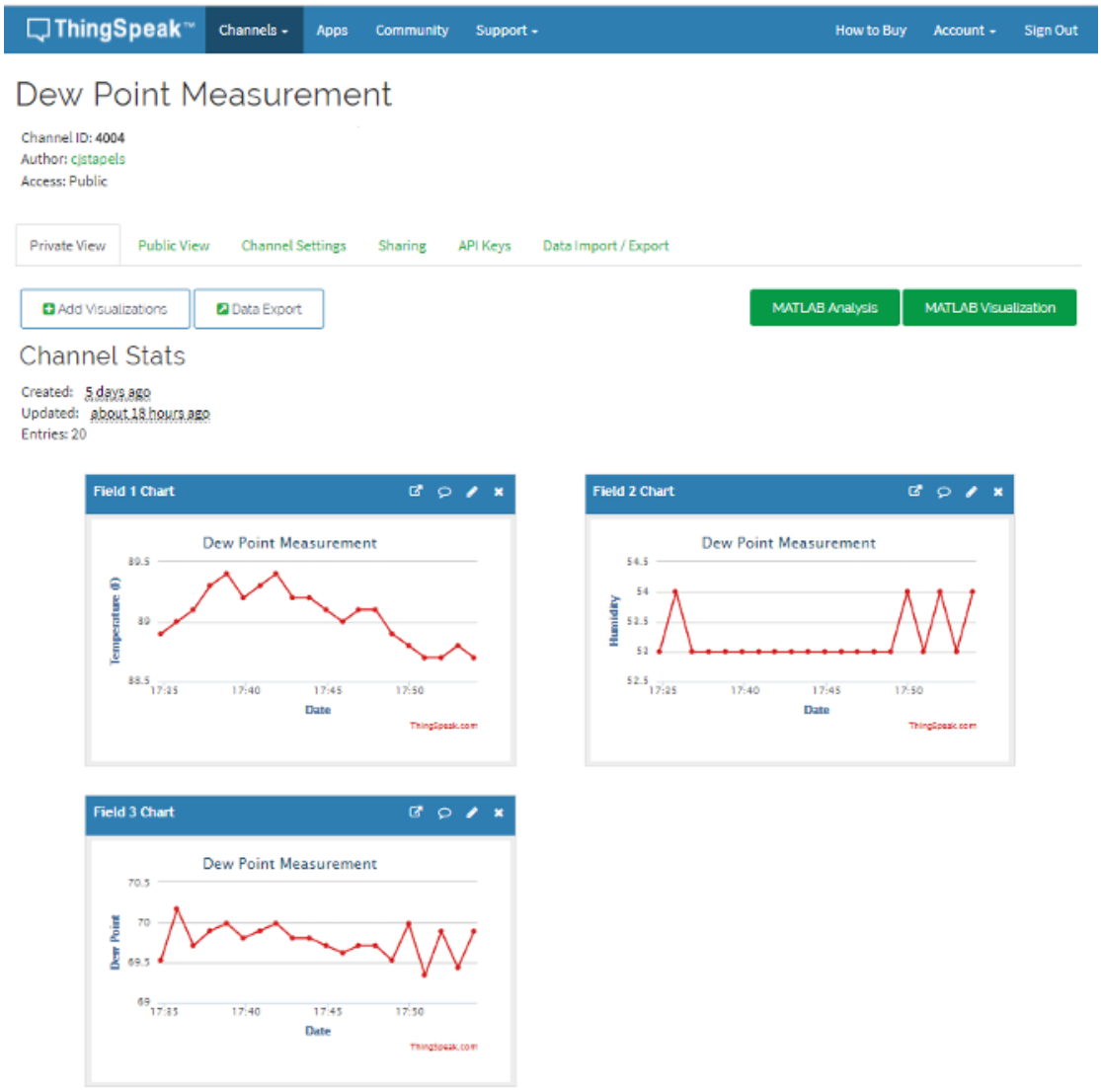
For the purpose of examining the outcome of the tutorial based on my personal experience, I managed to create, set up and activate my own channel in ThingSpeak platform to an external weather station that publish its APIs publicly and achieved the connection in the ThingSpeak panel to grant real-time weather data as shown in the following "Produced output – Result from the following tutorial" section on this page.

As these charts indicate, the indicators of weather sensor data including wind direction, wind speed, humidity, and temperature have been imported into my ThingSpeak channel with APIs, which can help the analysis of trends of the selected indicators in a

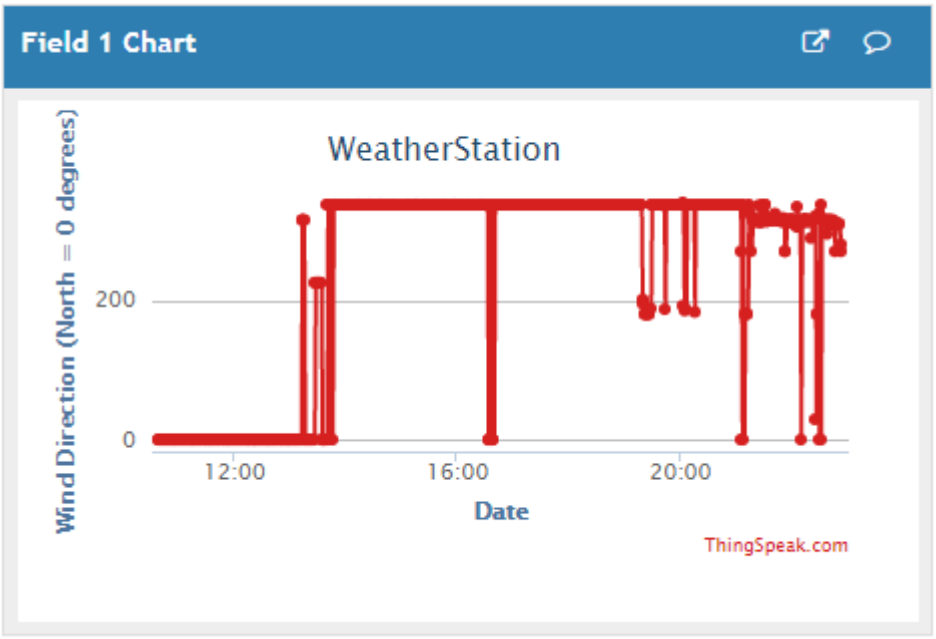
real-time manner.

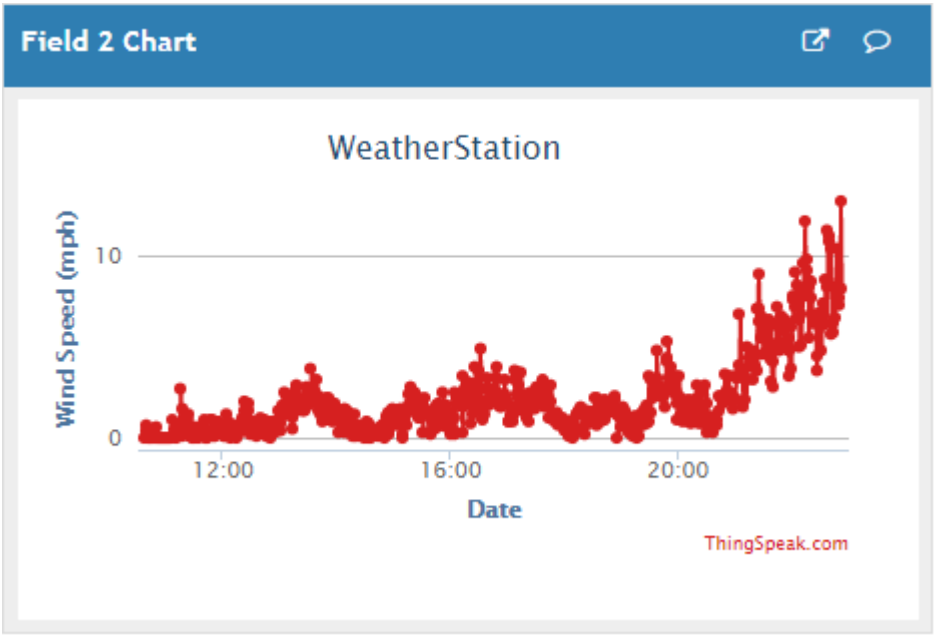
Produced output

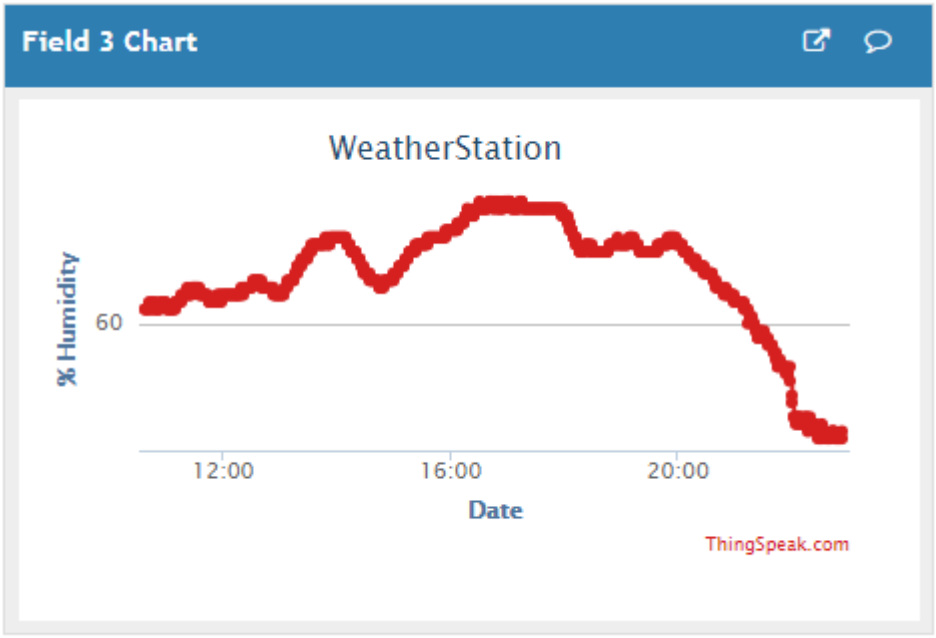
- Result from following the tutorial

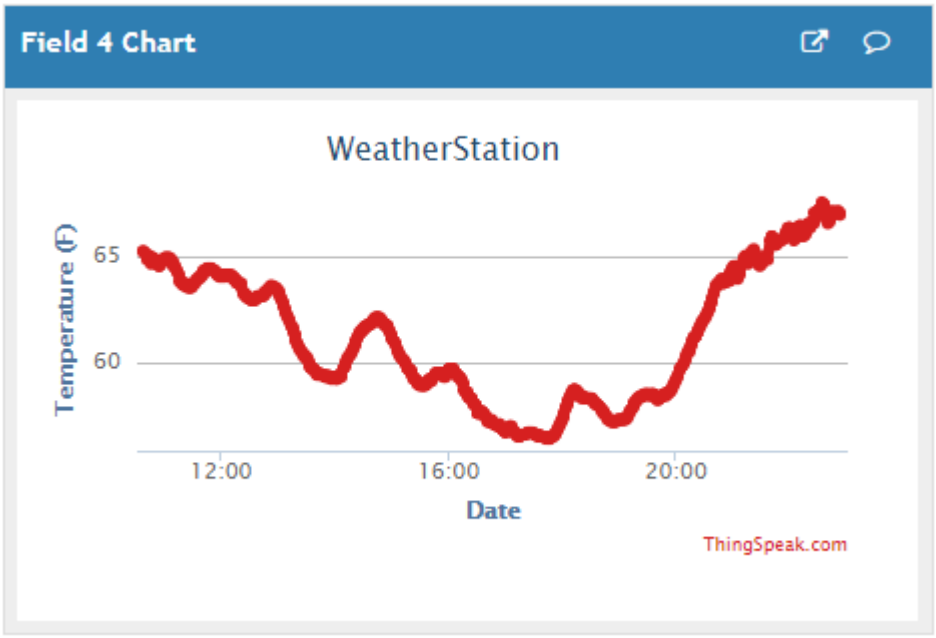


- Custom version


Field 1 Chart
WeatherStation
Wind Direction (North = 0 degrees)
200
0
12:00
16:00
20:00
Date
ThingSpeak.com


Field 2 Chart
WeatherStation
Wind Speed (mph)
10
0
12:00
16:00
20:00
Date
ThingSpeak.com





Notable features

In this section, I was trying to follow up and practise on the recommended tutorials. However, most of them required hardware operation, which made it difficult to be conducted. To find a viable way to learn new knowledge and skills in collecting and presenting sensor data, I explored the cloud-based search and finally find the ThingSpeak platform, which provides cloud-based Internet of Things application and API services. Using the ThingSpeak, I successfully practises how to set up and collect and visualise IoT data in a real-time manner.

References

MathWorks, 2021. *Get Started With Thingspeak - Mathworks Australia*. [online] Au.mathworks.com. Available at: <https://au.mathworks.com/help/thingspeak/getting-started-with-thingspeak.html?s_tid=CRUX_lftnav>.

Thingspeak, 2021. *Iot Analytics - Thingspeak Internet Of Things*. [online] Thingspeak.com. Available at: <https://thingspeak.com/>.