ECEGR 4640: Internet of Things
Date: 10/9/2025
Laboratory 2: Sending alerts from ThingSpeak

Goal: To send email alerts from ThingSpeak based on channel conditions.

Use the ThingSpeak alerts service to send notifications as email messages. Use the TimeControl app to trigger a MATLAB Analysis app at regular intervals. The MATLAB Analysis app analyzes the data to decide the appropriate email message to generate based on channel data. This is an exploratory lab activity. So, rather than providing step-by-step instructions, an overview of the methodology will be provided.

Prerequisite: Data from the Enviro pHAT sensor must be successfully, and continuously uploaded to a ThingSpeak channel.

Important: Users are limited to 2 alerts every 30 minutes. The rate limit is applied when the request is made, not when the email is sent. If you exceed the request limit, the API returns the response code 429.

MathWorks guide: https://www.mathworks.com/help/thingspeak/analyze-channel-data-to-send-email.html

Create a MATLAB Analysis

Analyze ThingSpeak data with MATLAB. You can use the result of your analysis to trigger web requests, such as a request for email from ThingSpeak alerts. To begin with, you can configure the analysis to read an hour of temperature data and trigger an alert when the temperature falls below a set threshold.

1) Select Apps > MATLAB Analysis and select New.

2) Select Read Channel to Trigger Email in the Examples section. The code below is prepopulated in your MATLAB analysis window.

3) Name your analysis and modify the code. Change alertApiKey to match your alerts API key. Start by setting the channel ID and alerts key. All alerts API keys start with TAK. This can be found in your ThingSpeak profile.

4) To read from your own private channel, change the channelID value and include your channel's ReadAPIKey.

Example: `thingSpeakRead(12397, field info, ReadKey='F6CSCVKX42WFZN9Y');`

5) Modify the code to set a low temperature threshold that will trigger an alert.

Create Time Control to Run Your Analysis

The TimeControl app can evaluate your ThingSpeak channel data and trigger other events. Create an instance of the TimeControl app that calls your MATLAB Analysis code every day. Select Apps > TimeControl, and then click New TimeControl.

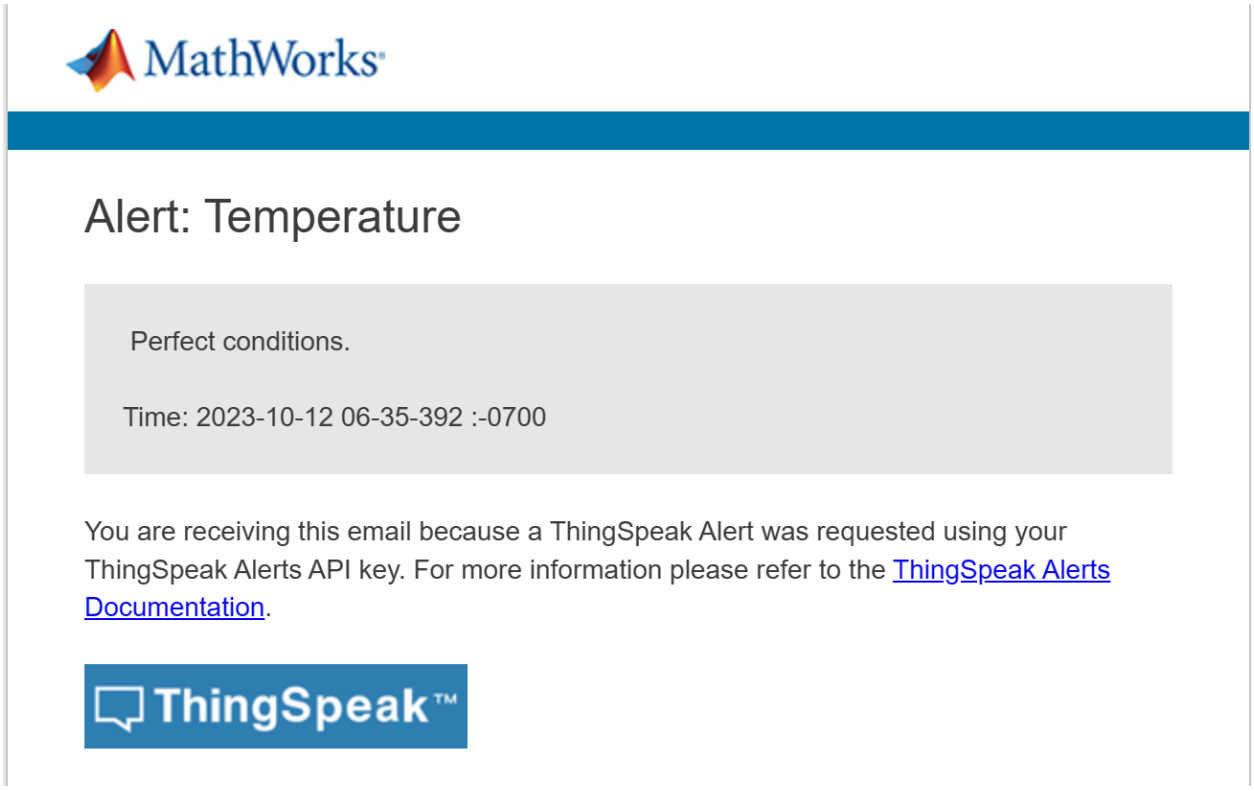
Name — Name the TimeControl.

Frequency — Select Recurring.

Recurrence — Select Minutes.

Action — Select MATLAB Analysis. In the code to execute list, select the name of the MATLAB Analysis you wrote previously.

Each time the TimeControl app runs, you receive an email letting you know if the temperature is below a certain threshold or not (depending on how you configure it).



- Repeat this exercise for all.py and motion_detect.py
- Use various capabilities of ThingSpeak to make the activity more interesting!