**Final Project Proposal**

SEIS603-02 – Summer 2020

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I have an unfinished basement that is used for a variety of purposes. Important to me personally is my wine storage and an exercise/workout area. I try to keep the temperature within a range that is not too warm for wine storage and not too cool for workouts; between 65F and 70F. Likewise, I try to keep the humidity between 45-50%. I currently do this by hopefully remembering to check the temperature and humidity a couple times a week and adjust by opening or closing heat/AC vents and turning on/off a dehumidifier. Being a technical and data guy, I’m almost embarrassed by this no-tech approach :-).

Project vision:

* Use a Raspberry Pi and a temperature/humidity sensor to measure temperature
  + Read the data from the sensor periodically (TBD but am thinking every 15 minutes)
    - Will use an Adafruit Si7021 sensor and Adafruit Python library
  + Convert the raw data
    - Temperature to Fahrenheit
    - Humidity to an integer percentage
  + Package the data and send to a RESTful API
* On a separate PC, acting as a server, create a RESTful API service
  + Using FastAPI, listen for messages
  + Unpack the received data
  + Store the data in a cloud-based MongoDB for future analysis
  + Check temperature and humidity for values being outside of defined thresholds for a period of time (to avoid false alerts)
    - Send an email to myself; have some type of check so I only get 1 email per day
    - Log an alert event in the MongoDB
  + Create pytest style tests for testing the API
* If time permits, do some simple data analytics via a Jupyter Notebook on the data stored in the MongoDB