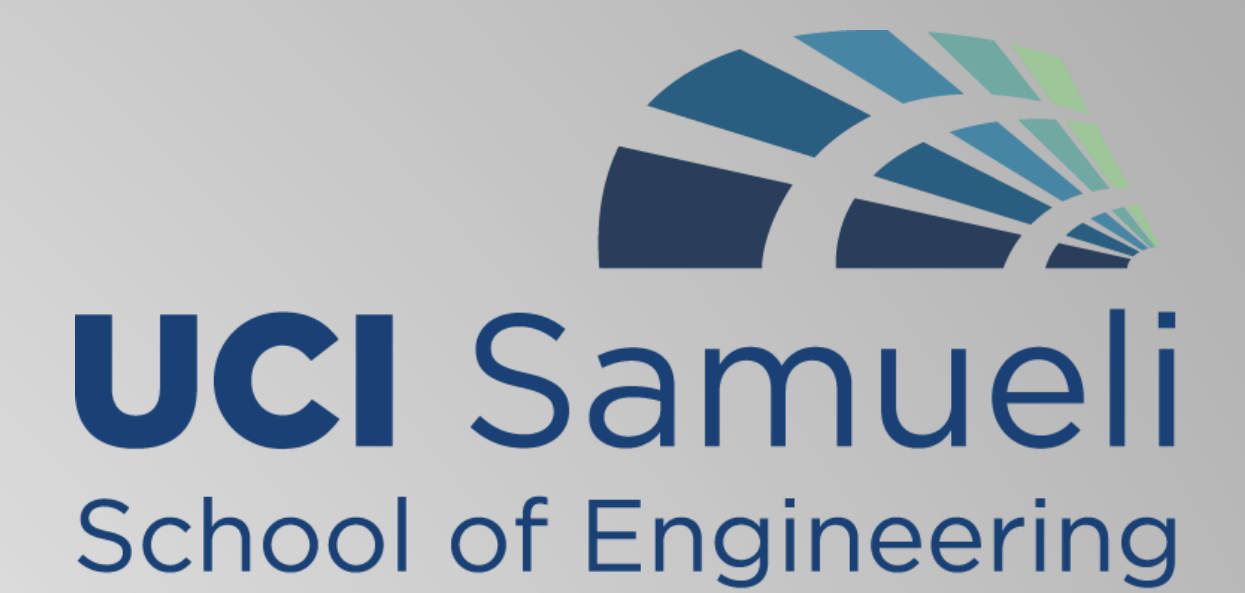




UCI E-Thermosensor

Adviser: Professor Yun Wang



Background:

A thermocouple is an electrical device used to detect the temperature changing. Nowadays, thermocouple, as a kind of thermal sensor, is being used in many fields, for example, hospital, vehicle engines probes and sensors. With the trend in demand for increased performance and reliability.

We are focusing on how the time response will change regarding the change in the size of the thermocouple in microscale. If the time response is reduced, the efficiency of the temperature sensor system will increase, which would benefit in many fields.

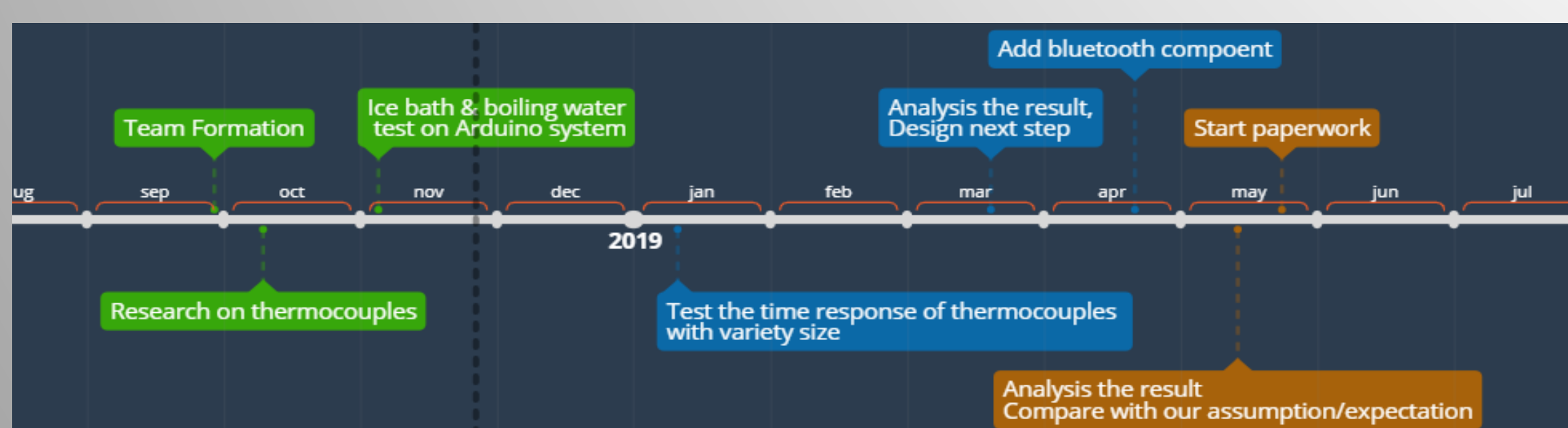
Goal:

Our goal for this project is decreasing the time response for an accurate reading from 0.06s to 0.03s by reducing the size of thermocouples. Having a faster response, thermocouples can be more efficient in measuring temperature changes in industrial, medical and daily aspects.

Objective:

- Redesign data acquisition circuit.
- Find relationship between time response and size of thermocouples.
- Reduce the time response from 0.06s to 0.03s.
- Find industrial demand and improve current design.

Timeline:



Innovation & Current Work:

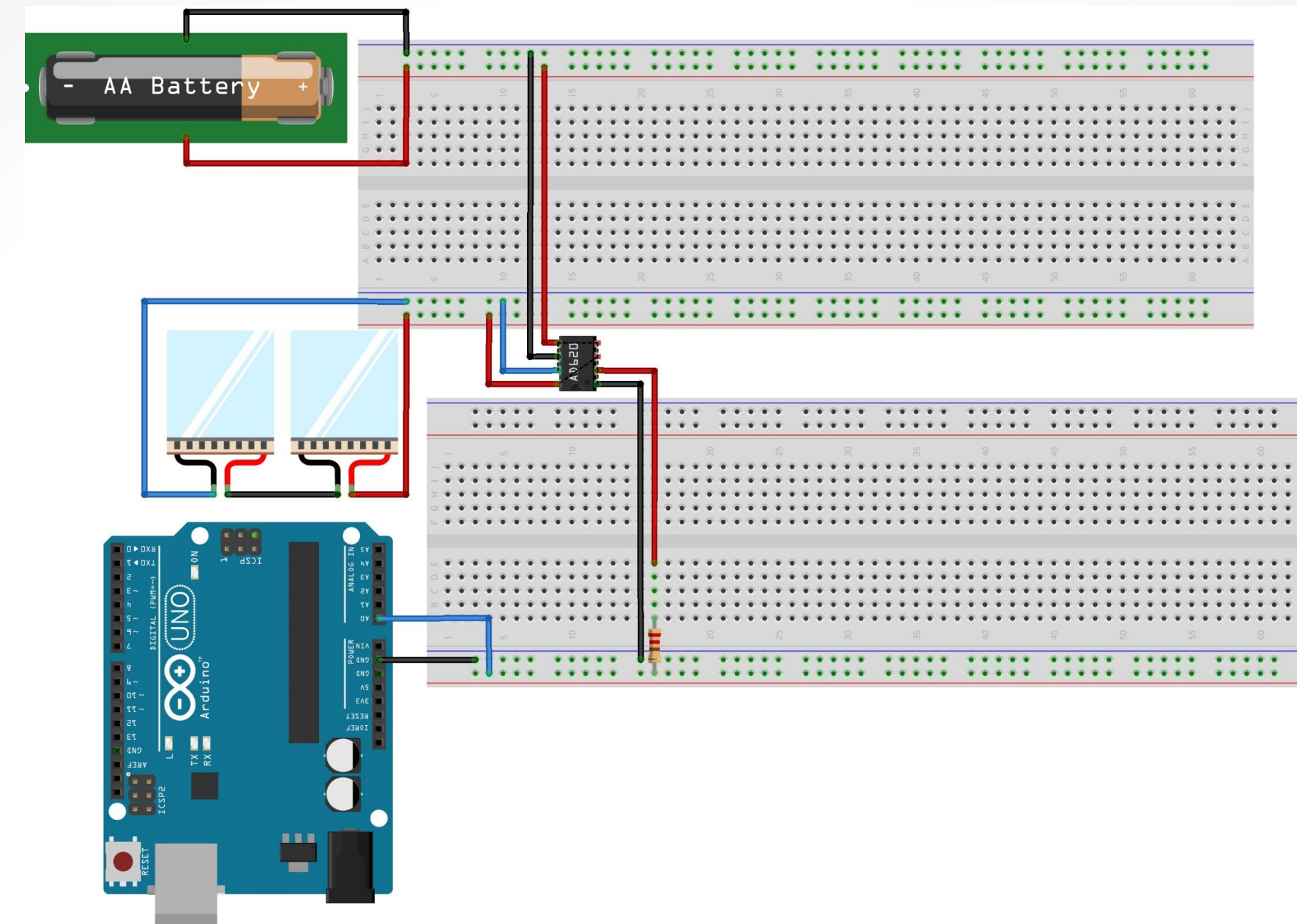


Figure1: Arduino system with AD620 amplifier & 12 V power supply

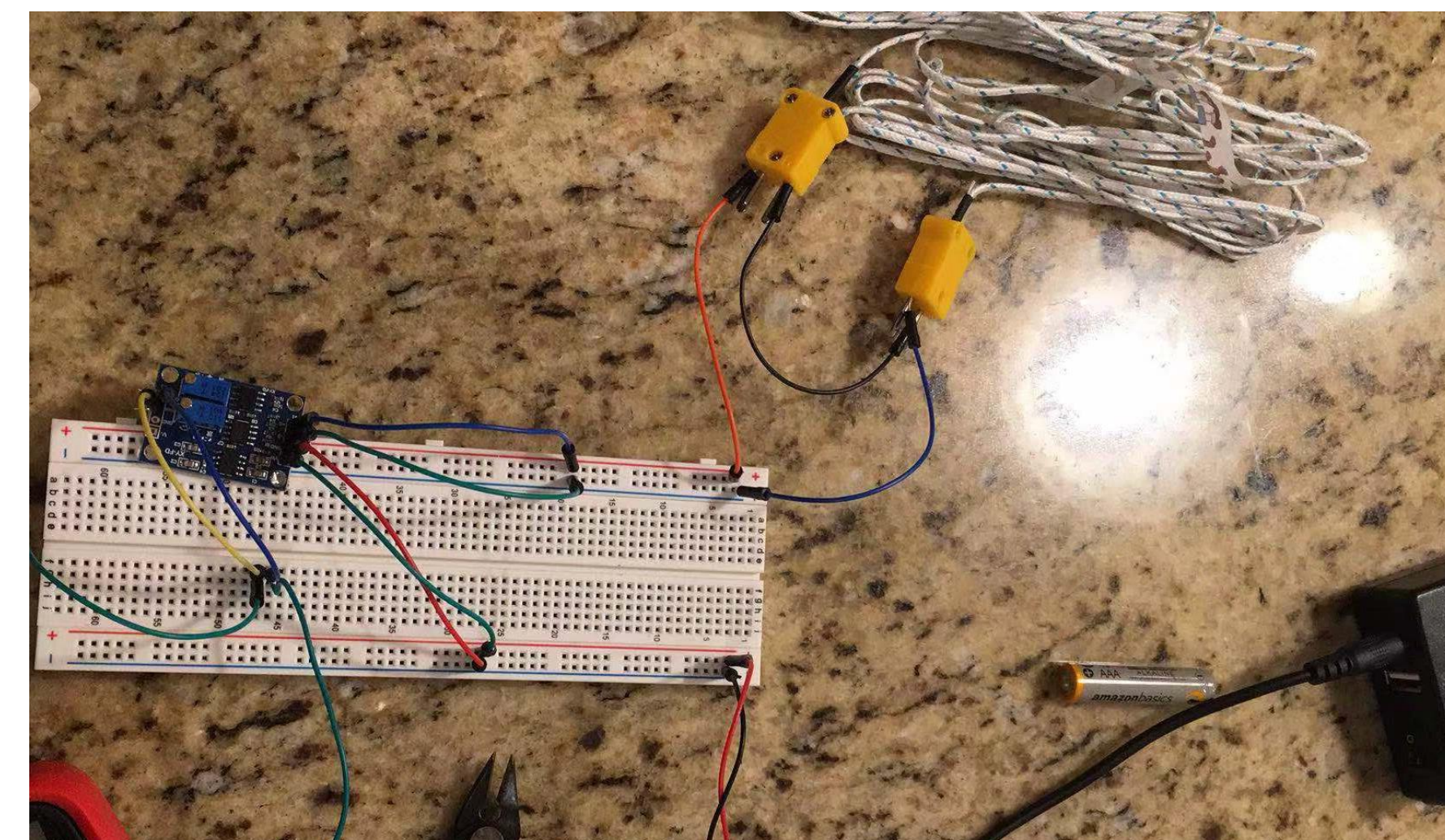


Figure2: Arduino system schematics

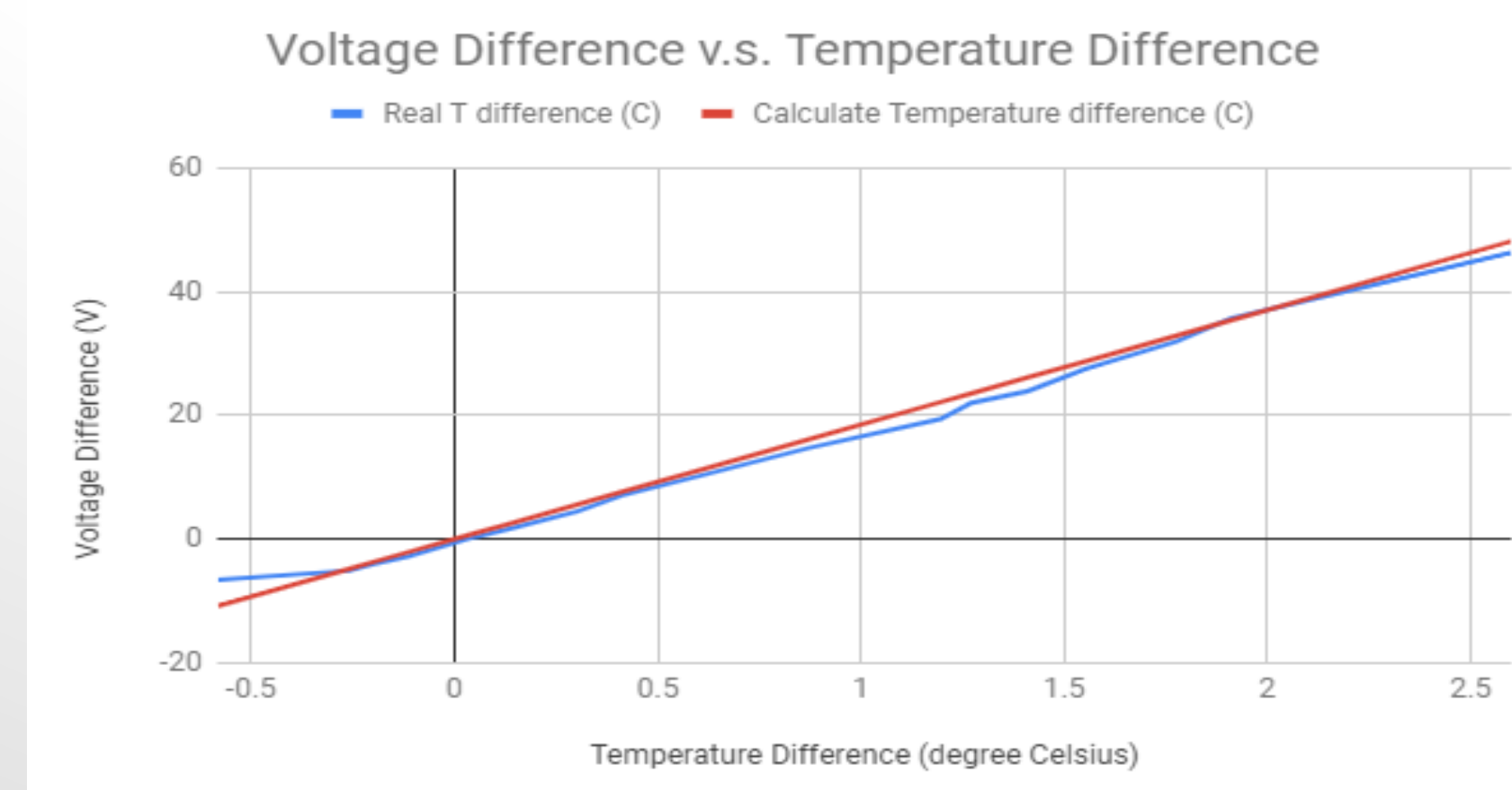
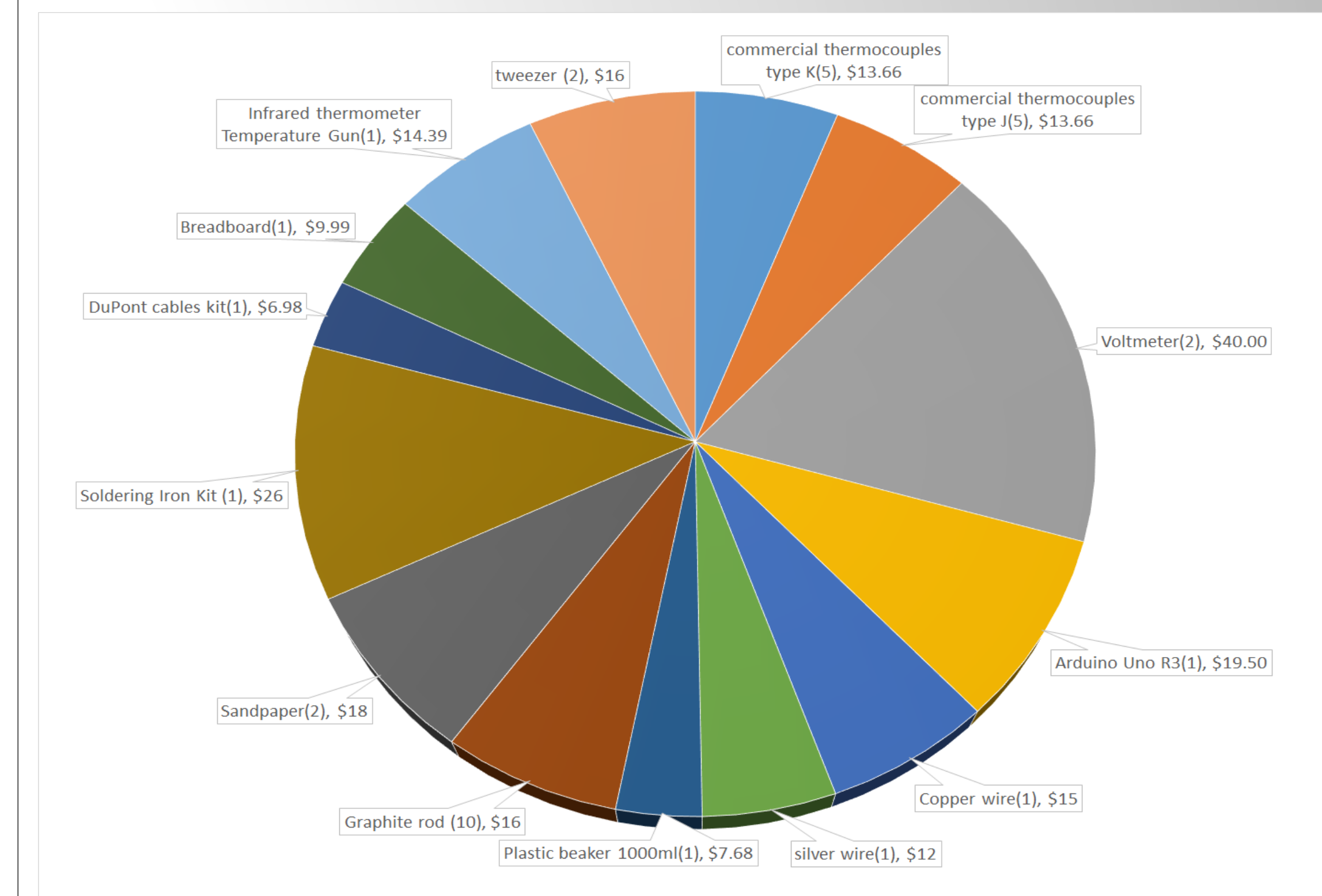


Figure3: Voltage Difference v.s. Temperature Difference plot by our system

Prospected work:

- Trim tip of thermocouple to different size and repeat ice bath and boiling water experiment.
- Build database for all results and data.
- Make the final thermocouple Bluetooth compatible.

Budget: 230\$



Team member:

Team lead: Xinjie Tang, Zhiqiu Huang
 Document Manager: Zijian Zhang, Songkun Li
 Safety Officer: Bowen Chen
 Purchase Manager: Zhengtao Li

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