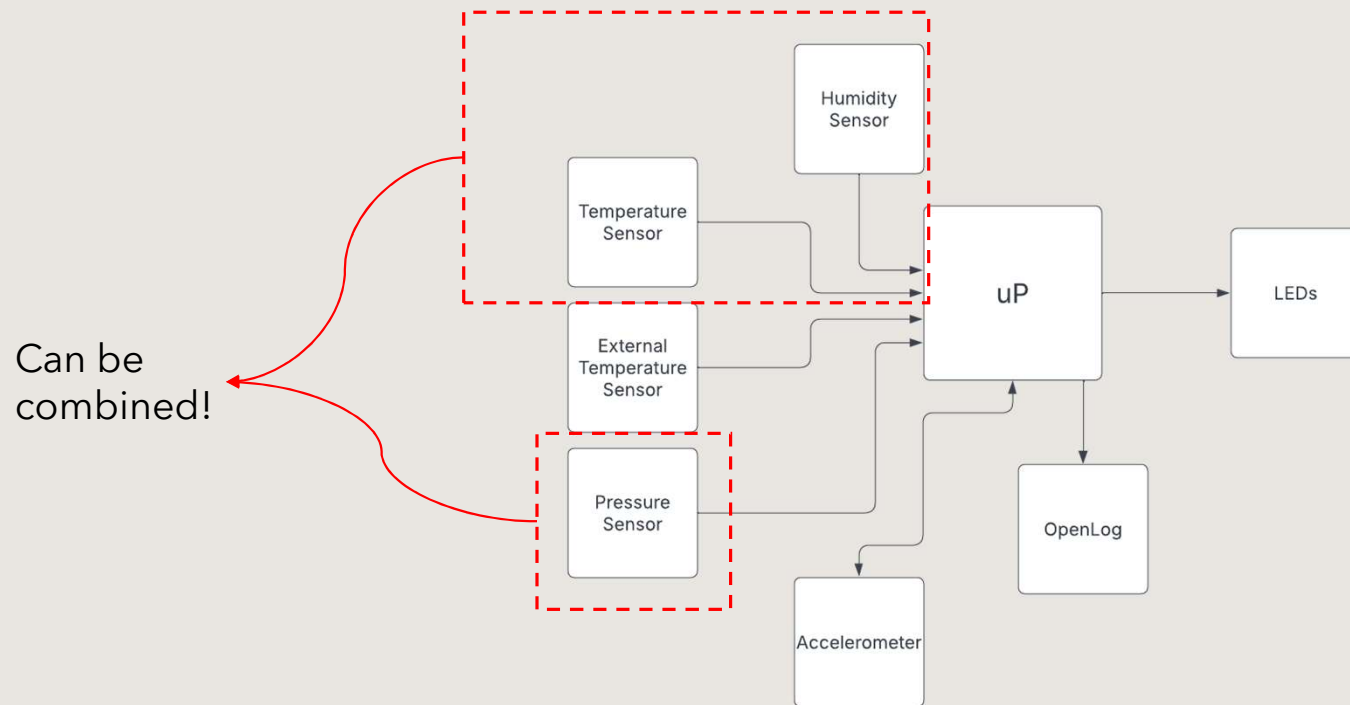




Microprocessors Final Project

Jackson Hall

Block Diagram



System Cost

Original Design Part	Cost (\$)
	\$
Sparkfun Openlog	16.95
	\$
Sparkfun Accelerometer	16.95
Sparkfun Humidity Sensor	\$
	10.95
	\$
Arduino Uno R3	27.60
	\$
Silicon Pressure Sensor	11.70
	\$
PCB Shield (assumed)	2.00
	\$
LEDs	0.08
	\$
Pin Headers (16POS)	0.87
	\$
TOTAL	89.24

Discontinued!

My Design Part	Cost (\$)
	\$
Adafruit BME280	14.95
TMP36GT9Z Temp Sensor	\$
	1.42
MPU6050 Accelerometer	\$
	6.99
	\$
Sparkfun Openlog	16.95
	\$
PCB Shield (assumed)	2.00
	\$
Arduino Uno R4	20.00
	\$
LEDs	0.08
330 Ohm Resistor	
	\$
Pin Headers (16POS)	0.87
	\$
TOTAL	63.40

System Weight

Original Design

Part	Weight (g)
Sparkfun Openlog	2
Sparkfun Accelerometer	2
Sparkfun Humidity Sensor	2
Arduino Uno R3	25
Silicon Pressure Sensor	2.5
PCB Shield (Assumed price)	20
LEDs	1.2
Pin Headers (16POS)	3
	57.7

My Design

Part	Weight (g)
Adafruit BME280	1.2
TMP36GT9Z Temp Sensor	0.5
MPU6050 Accelerometer	1
Sparkfun Openlog	2
PCB Shield	20
Arduino Uno R4	25
LEDs	1.2
Pin Headers (16POS)	3
	53.9

Max Power Consumption

V	I	P
3.3	2.00E-02	6.60E-02
3.3	0.005	1.65E-02
3.3	0.001	3.30E-03
5	0.01	5.00E-02
5	0.005	2.50E-02
		0.00E+00
		0.00E+00
5	0.06	3.00E-01
		0.4608

P = ~460mW

V	I	P
3.3	0.0036	0.01188
5	5.00E-05	0.00025
3.3	0.0035	0.01155
3.3	0.02	0.066
		0
5	0.05	0.25
5	0.02	0.1
		0
		0.43968

P = ~440mW

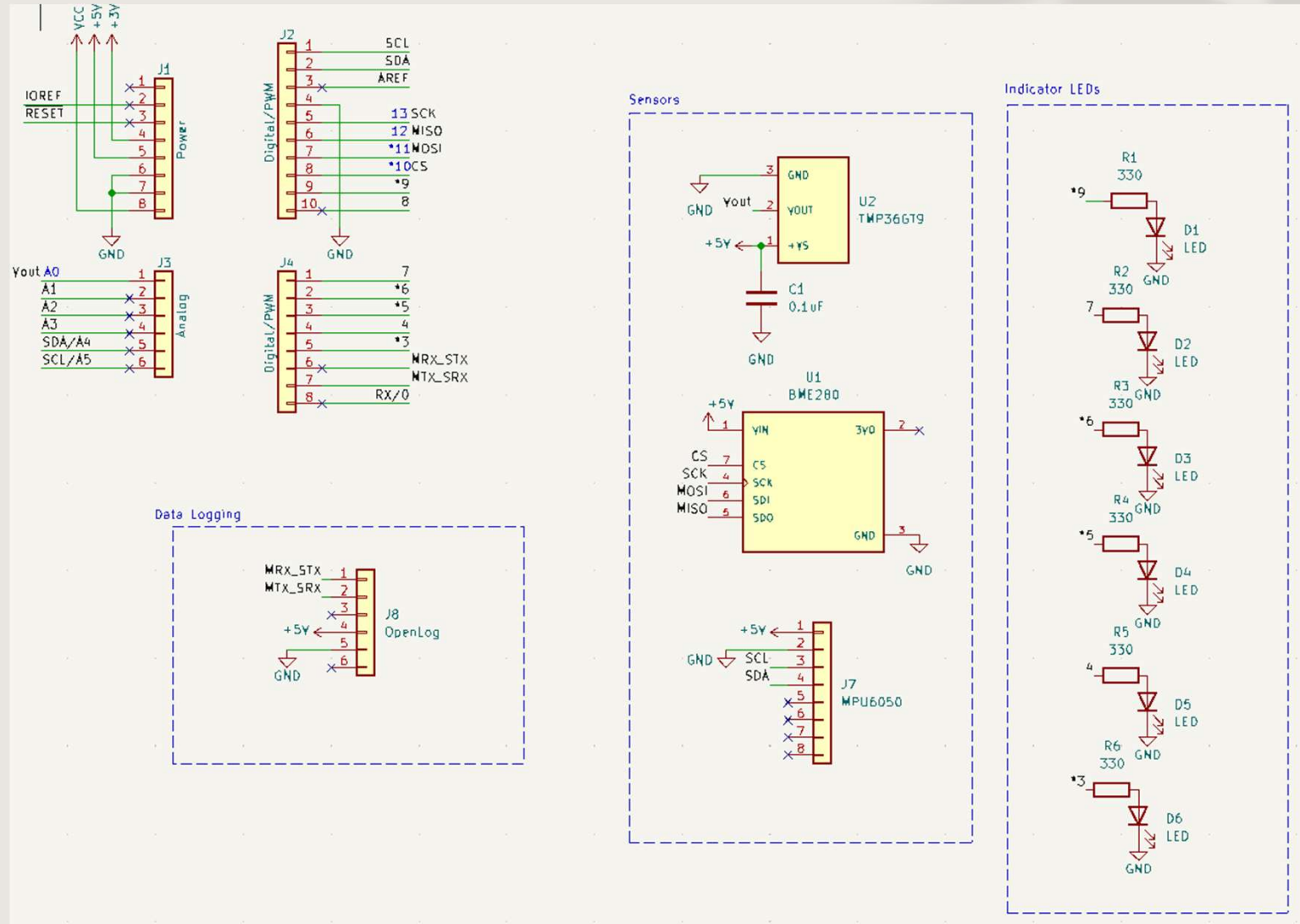
Alternative Design

A few improvements can be made to the initial design.

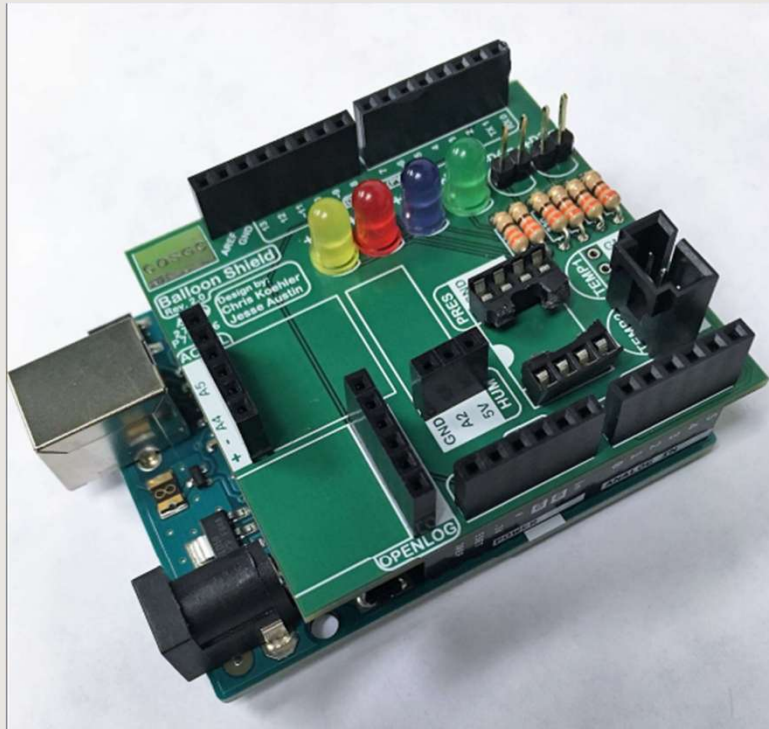
The temperature, pressure and humidity sensors can be consolidated to a single module, which drastically reduces costs.

Better and cheaper components were also chosen in general without reducing the quality of the design.

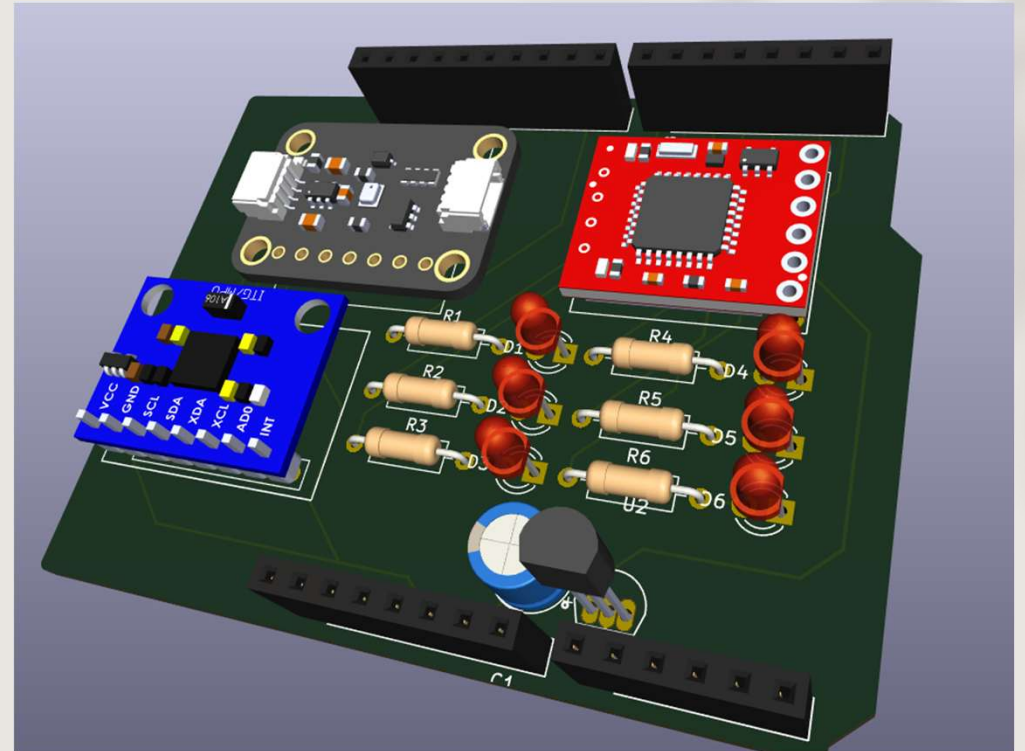
Schematic



PCB Design



VS.



References

- <https://www.colorado.edu/center/spacegrant/statewide-programs/remote-kits-learning-modules/high-altitude-balloon-payload-remote-skill-module-0#accordion-1065444066-1>