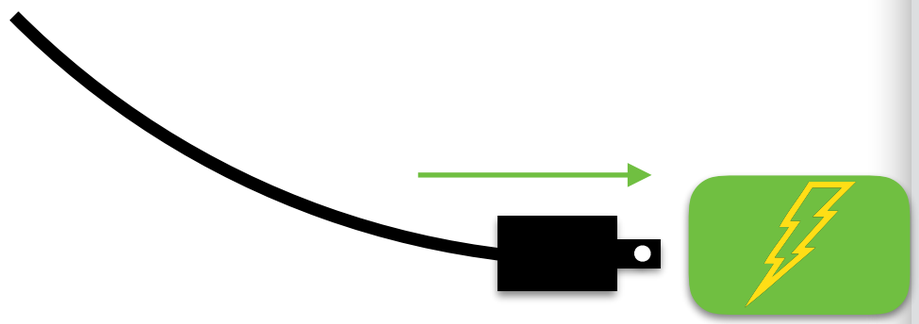
VIRtual eTracker

North Allegheny Senior High School

Steven Lu, Akshath Jain, Nikhil Behari

Track energy consumption in real time

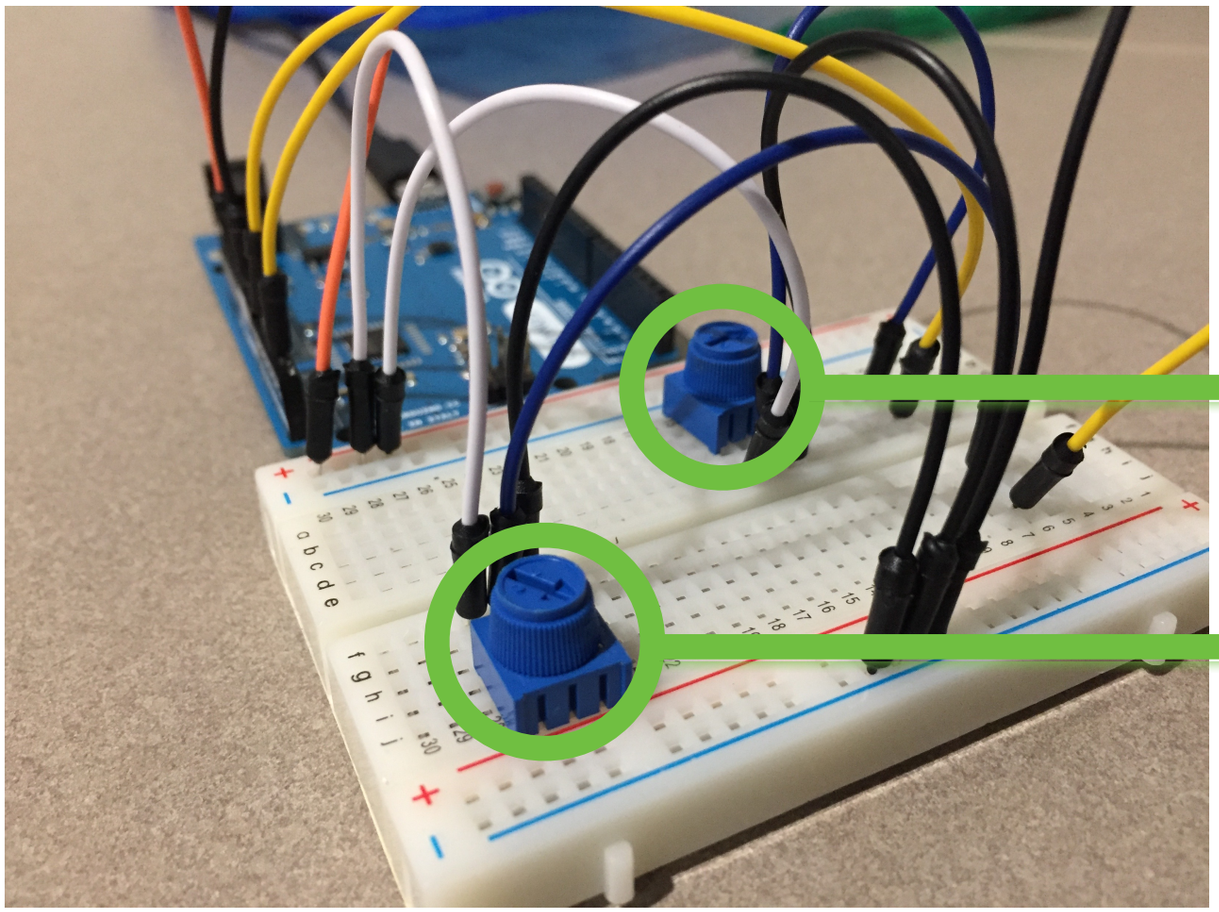
- Plug into wall outlet between socket and device
- Turn on bluetooth on your mobile device
- Get real time power consumption!



The hardware component connects wirelessly through Bluetooth low energy

10.1 μA at 120s interval

Our proof of concept simulates current usage from common appliances



Potentiometers vary the voltage input reading, which mimics the ampere usage of a household appliance

The following equations are used to simulate ampere usage:

Washing machine simulation

analogRead * 2 * (5 / 1023.0)

Washing machines draw 5-10 amps at 120 V

Television simulation

analogRead / 10 * (5 / 1023.0)

A 32” LED/LCD display will draw ~0.5 amps at 120 V

Voltage from Arduino ranges from 0 to 5, which is related to an appropriate ampere value

From simulated ampere values, wattage is calculated

Power = Current x Voltage

P = I x V

W = A x V

W = calculated * 120 V

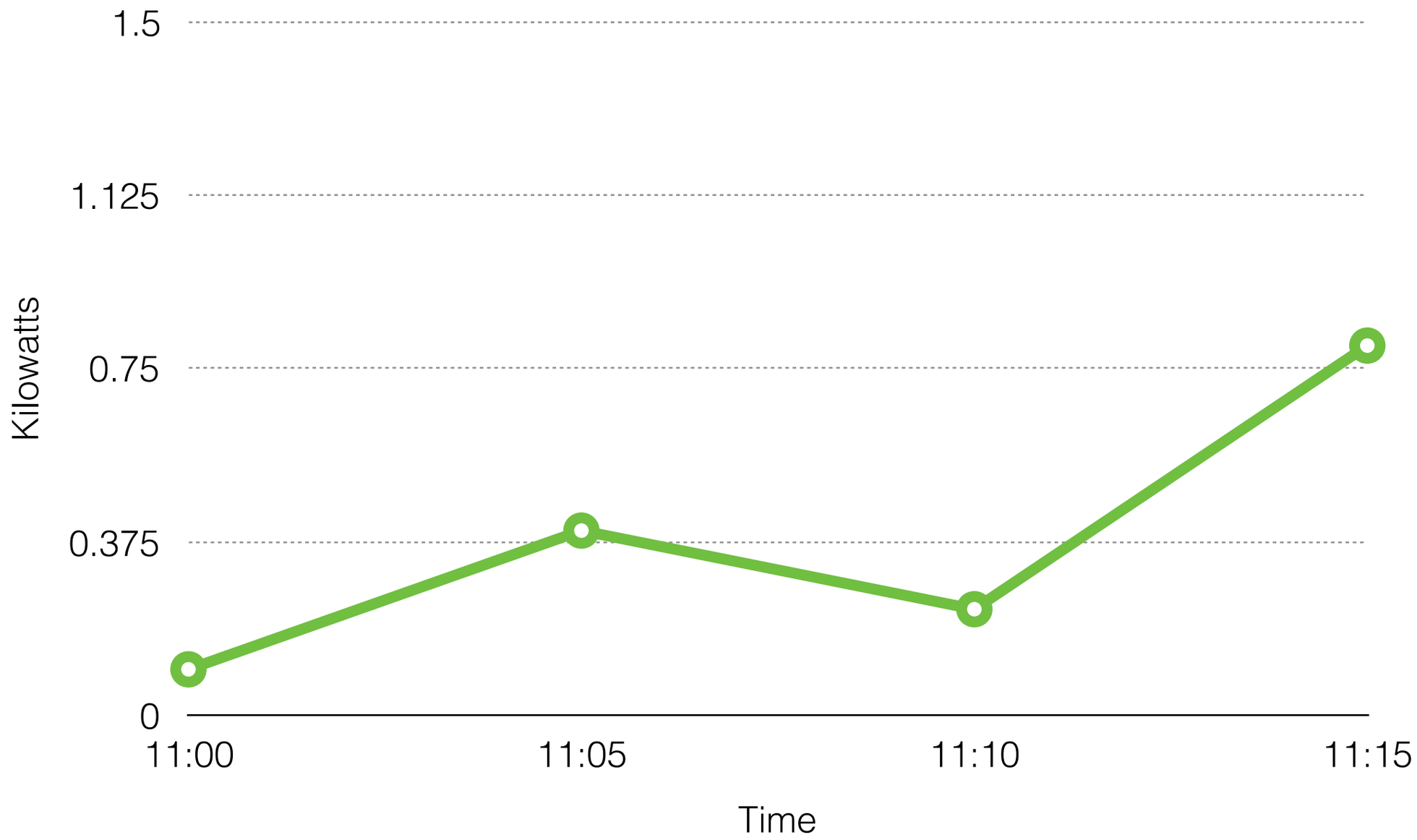
kWh and cost measurements are displayed in real time at 1 Hz

kWh = (W / 1000) * 1 hr

Cost = kWh * 13.2 cents/kWh

In PA, the average household payed ¢13.2

A real time graph is displayed containing wattage vs . time data



Individual modules may be selected as well, in addition total energy usage

Simple. Effective. Useful.

- The US wastes nearly 80% of its energy every year

- The energy wasted in the US could power the UK for 7 years

- Devices on standby or sleep mode (idle power mode) account for more than $19 billion in electricity bills per year

Target market: individuals who want more control over their household power usage

In PA alone, the average household will spend $1500 a year on energy

*By our estimate, the VIRtual eTracker would retail at **only $12.99***