WATTcher: A Low-Configuration Energy Sensing Platform
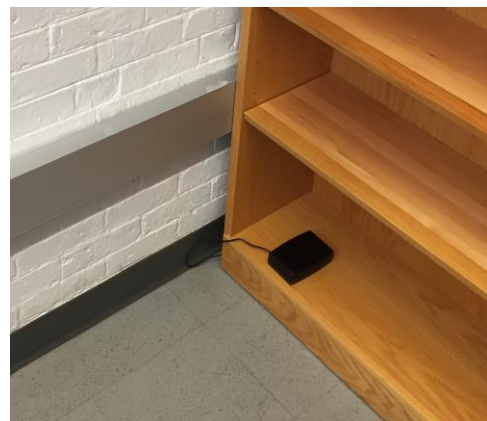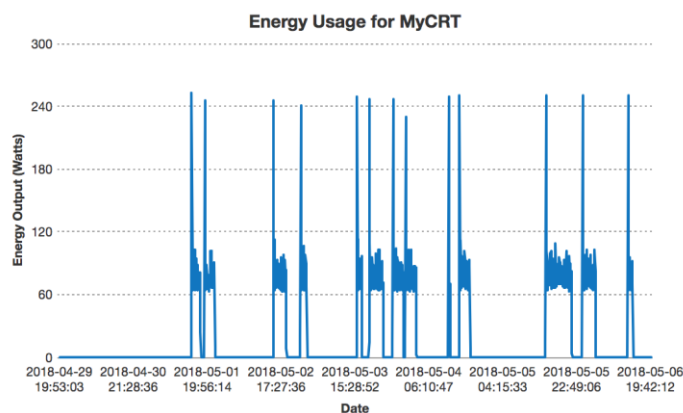
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In response to the growing importance of energy sustainability in buildings, scientists have collected energy datasets to aid research. As these datasets and their collection methods are imperfect, we created WATTcher to provide cheap, easily installed electricity monitoring in buildings. A primary goal of the project was to ensure simple installation and portable hardware, meaning that experts would not have to enter homes in order to gather data.

Built on hardware funded by this award, the WATTcher combines a small Raspberry Pi computer, a remote communications USB (Z-Stick), and multiple energy sensors to create a small network in a particular building. Within this building, the Raspberry Pi receives readings from deployed sensors, and uploads data to our central server. We then store the data within a database. In addition to simple installation, WATTcher aims to collect high quality data. Data is broad (e.g., 10 different TVs), high resolution (1 Hz, or 1 reading per second), and device-specific (read from just one appliance, rather than a building-level monitor).

In an effort to promote and reward user participation, we also designed a web interface for interacting with collected data. Home or building owners can visit our website and see for themselves where they're spending the most money on appliance electricity. Below, see an example of the kind of data that users can view using our interface (graph is Watts over time).

We designed a prototype WATTcher, and have deployed over eight around Bowdoin's campus. See the prototype, small and unobtrusive, on a shelf below. It is our goal to use this successful infrastructure to increase our deployment size, and begin collecting a meaningful dataset that can be shared with researchers and make an impact on the sustainability of buildings around the world.

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