

**Project Title:** develop a hardware abstraction layer for smart buildings

### **Background**

Smart buildings and the internet of things present great opportunities to scale operational energy savings in buildings. Progress is evident, with several software companies introducing new products over the last five years offering abilities to access, store, visualize, and analyze utility meter and building automation system data. Yet the rate of growth in advanced optimization has been slower in buildings than observed in other areas. Efforts to deploy smart analytics in buildings are substantially hindered by proprietary data architectures used by traditional building controls companies and new software houses.

### **Project Description**

This project aims at developing open-source container (e.g. docker) -based software connectors to extract data from legacy building management systems and integrate them with a new data warehouse that Lawrence Berkeley National Laboratory (LBNL) is building, to host campus data. LBNL is looking for a team of students to help design and implement these software tools, that represent a new hardware abstraction layer for the data warehouse. The team will have the opportunity to work with LBNL scientists, IT professionals and facility engineers.

### **Outcome**

The project team will design and develop prototype connectors and deploy them on a building automation system servers, gathering data from a legacy protocols (i.e. BACnet, modbus, SQL) and posting them to a time-series database using a rest API. The team will implement open source technologies to create a complete software package including logging, performance metrics and container monitoring.

### **Skillset**

The ideal team will have knowledge of Python, IT networks and protocols and willingness to learn and collaborate with professionals.