CHPB-29-2018:

New Low-Cost Sensing Network for Indoor Environmental Monitoring and Control in Buildings

Objective:

- To investigate new, flexible low-cost room sensing systems for standard indoor environmental control (temperature, lighting, humidity, envelope systems) as well as additional measurements (MRT, glare)
- To assess the performance in terms of accuracy, reliability and communication with control systems in real building zones and
- To implement methods and controls in real case studies.

Expected Results / Impact:

- A promising new technology for indoor environmental monitoring and control (temperature, humidity, lighting, envelope, occupancy, etc.)
- The overall method provides flexibility in monitoring (local sensing), processing (model-based) and communication (networking) with other devices and control units,
- It is targeted to provide higher comfort to occupants while reducing system costs and energy use for air-conditioning and lighting.

Approach:

- Investigate available low-cost wired/wireless sensors in terms of their accuracy, reliability, communication capabilities.
- Develop the required models and frameworks for efficient communication between WSN, receiving units and building control and automation system
- We will integrate the measurement, communication and control process, implement it in real zones in HL and evaluate it as new low-cost flexible sensing, processing and communication method for indoor environmental monitoring and control applications.

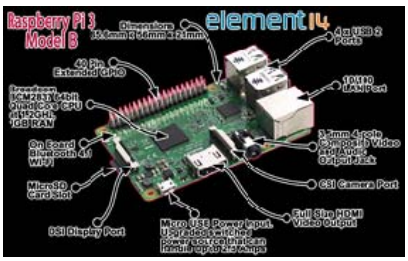
Schedule

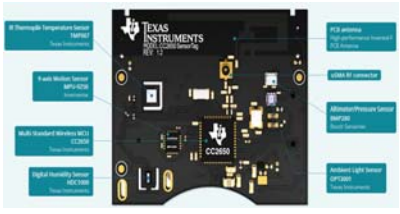
- Months 1-3: investigate different low-cost sensors and receiving/processing units in terms of their accuracy, reliability and communication capabilities
- Months 3-6: development of required scripts/interfaces for stable and reliable communication between sensor modules, and building control and automation system
- Months 6-12: integration of the entire process of measurements, communication and processing, including embedded model-based controls, and implementation in real building zones in Herrick Labs

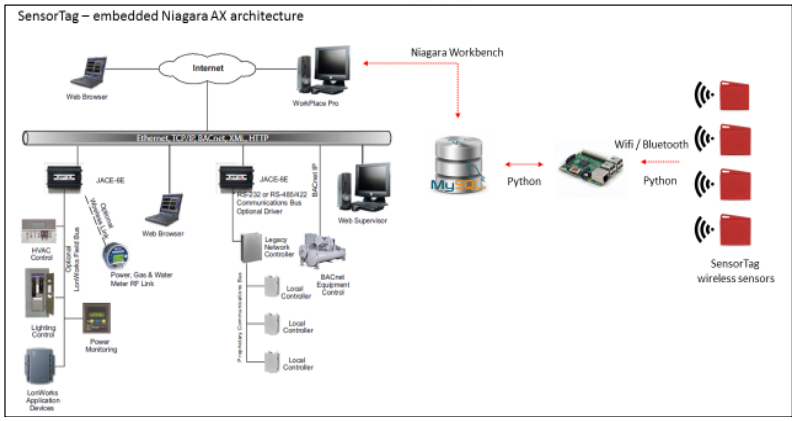
Herrick Laboratories, Purdue University

Center for High Performance Buildings at Purdue

New Low-Cost Sensing Network for Indoor Environmental Monitoring and Control in Buildings







Herrick Laboratories, Purdue University