

## CHPB-19-2018: Recognition of Building Occupant Behaviors from Indoor Environment Parameters by a Data Mining Approach (Year 2)

### Objective:

- Develop a method for evaluating the impact of occupant behaviors on building energy use

### Problem:

- Estimation of building energy use is not accurate due to various occupant behaviors
- Large energy use in building does not always lead to satisfied thermal environment

### Approach:

Task 1: Expanding the data collection in different buildings and occupants (**More offices at HLAB, 5 more buildings on campus, more buildings and homes in Lafayette, diversified occupants, etc.**)

Task 2: Studying the impact of occupant behaviors on building energy consumption (**Implement comfort and behavior models into E+. Collect energy data from HLAB offices to validate the simulations by E+.**)



### Expected Results / Impact:

- An improved model of acceptable office indoor environment based on occupant behaviors
- E+ with the acceptable comfort model and occupant behavior model
- Measured data of energy use
- Validated E+ simulation results

### Schedule:

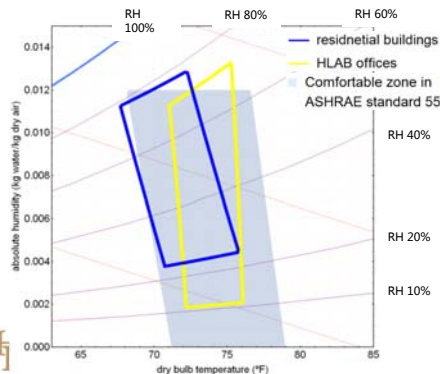
| Tasks                                     | 2018 |    |    |    |
|---|------|----|----|----|
|   | Q1   | Q2 | Q3 | Q4 |
| Data acquisition in more buildings        |      |    |    |    |
| Improvement of the comfort model          |      |    |    |    |
| Measurements of energy use in HLAB office |      |    |    |    |
| Model implementation to EnergyPlus        |      |    |    |    |
| Validation of the simulation results      |      |    |    |    |



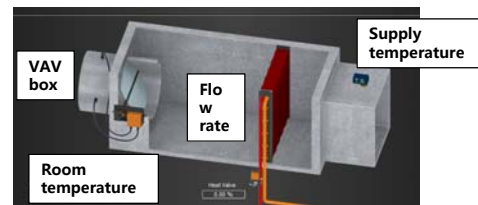
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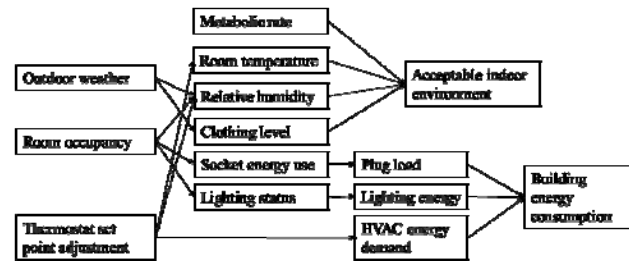
Data logger, thermostat and building automation system



Comparison of acceptable indoor environment model with



VAV box for office indoor environment control



Program structure of E+ implemented with comfort and occupant behavior model

