Concept Note

Optimizing HVAC Operation for Occupant Comfort and Energy Savings

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In UVA's LinkLab, as a part of the Living Link Lab Program, there is a significant amount of environmental and occupancy data available for analysis. This presents an opportunity for detailed study of the performance of HVAC systems among multiple metrics outside of temperature and humidity, as well as the deeper consideration of potential energy savings which could be gained from a holistically "smart" HVAC system. The overall goal of such an analysis would be to minimize energy usage while still maintaining an optimally comfortable environment for any potential occupants of the building.

In order to leverage timeseries analysis in this pursuit, the goal can be subdivided into two parts:

1. Analyze how various "levers" of operation of the HVAC system affect energy consumption
2. Analyze how various "levers" of operation of the HVAC system affect the collected metrics of comfortability

The data requirements of the first part would be:

1. Detailed data on HVAC system operation (some data available, pending further exploration)
2. Data on HVAC system energy consumption (data not currently available, can be estimated using HVAC system specifications)

The data requirements of the second part would be:

1. Detailed data on HVAC system operation (some data available, pending further exploration)
2. Data on CO2, temperature, humidity, occupancy, and other selected metrics (available through living link lab)