**EnRoute Abstract**

The EnRoute project will focus on designing a building model with scaled down HVAC unit and implementing controls on mbeds that communicate to Matlab via BACnet. Our building will consist of four heating/cooling zones with two levels featuring adjoining rooms. The HVAC unit will be on the roof of this building and circulate air using 1” PVC pipe. Supply entry points are restricted using a servo control valve.

The HVAC unit will handle heating and cooling, as well as airflow through the ductwork using one [blower](https://www.sparkfun.com/products/11270) for supply and one for return air. Return air can be recycled to the HVAC or vented to the outside. Fresh air can also be pulled into the HVAC. Heating and cooling will be handled with a peltier thermoelectric cooler or a resistive electric heater and chilled water.

Control for this project will use three mbeds. There will be one mbed per story, and one master controller for the HVAC. The mbeds for each story will take measurements, control the valves, and control the heating bulb. These mbeds will communicate over RS232 to the master. The master mbed will control the HVAC unit and handle communication to the host computer. We will also incorporate a flow sensor in and add sensors for measuring power consumption.

**Phase 1:** To be complete by November 2nd

* Prototype design for single room. (Dan/Larry)
  + Test blowers to ensure they are powerful enough.
* Begin electrical network over serial. (Neel)
* Prototype damper valves and validate performance. (Dan/Larry)
* Test Peltier unit to ensure proper functionality. (Dan/Larry/Neel)
  + If this unit is not effective, test chilled water cooling.

**Phase 2:** To be completed by November 16th

* Finalize building design and construction. (Dan/Larry)
* Implement controls in building. (Dan/Larry/Neel)
* Begin work on BACnet communication. (Neel)

**Phase 3:** To be completed by November 27th

* Modify building to fit last minute additions. (Dan/Larry)
* Implement MATLAB and GUI control. (Dan/Neel)
* Finalize BACnet communication. (Dan/Larry/Neel)
* Add building enclosure. (Dan/Larry)

**Extra-Credit Aspects:**

* Local reheat units.