**Motivation**

Buildings consume significant energy:
- More than 70% of total US energy consumption
- More than 40% of total carbon emissions

How can we reduce building energy footprint?

**HVAC constitutes major part** of building energy consumption. So goal should be to reduce HVAC energy consumption. But how?

**The HVAC Control System**

- Occupancy data is sent to our central database.
- Our engine then analyzes the data and duty cycles the HVAC based on the real time occupancy information.

**The Synergy Occupancy Node**

- Wireless sensor node to determine occupancy
  - Low power and lifetime exceeding several years.
  - Focus on low cost (less than $15) and form factor for ease of deployment.

- Deployed Zigbee® based sensor network consisting of occupancy nodes in offices across 2nd floor of CSE Building (EBU3b)

- Occupancy nodes update database with room-wise occupancy information and our backend engine then duty cycles the HVAC based on the real time occupancy information.

**Aggressive Duty Cycling of Smart Buildings**

- Occupancy data is sent to our central database.
- Our engine then analyzes the data and duty cycles the HVAC based on the real time occupancy information.