Building Information, Inhabitant, Interaction and Intelligent Integrated Modeling (BI^{5}M)

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Challenge: *Our buildings are broken*

$400B annually for power, heating, and cooling

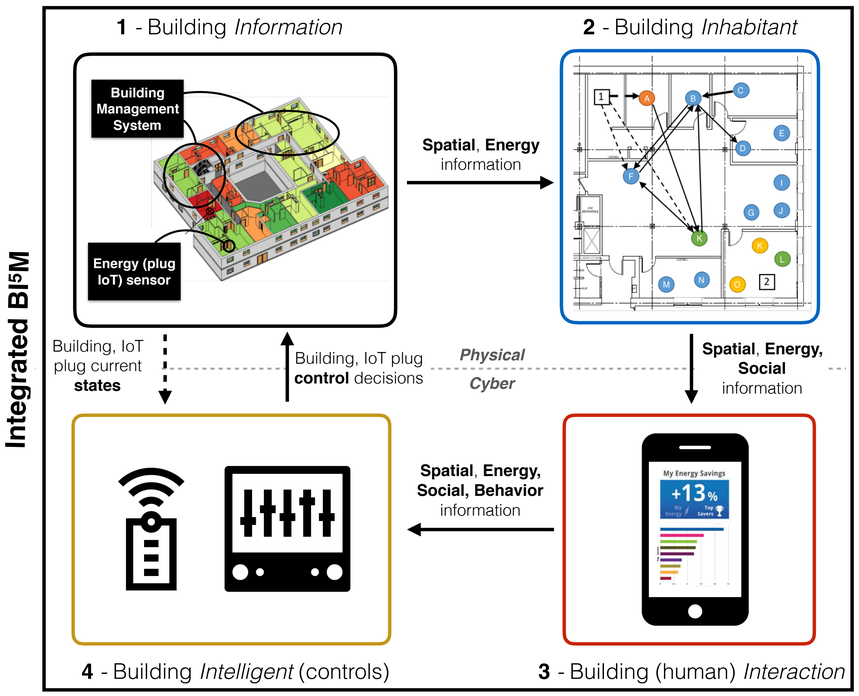
Largest producers of environmental emissions

Low occupant comfort and satisfaction

We require a new cyber-physical control paradigm that can leverage the two-way linkages between a **building's physical systems / layout** *and* **occupant behavioral dynamics**.

Solution: *BI^{5}M*

Our ***integrated*** approach combines physical building ***information*** with cyber ***inhabitant*** and (building-human) ***interaction*** models to enable ***intelligent*** control of commercial buildings.



Broader Impacts

Reduce energy consumption / costs / emissions from buildings + improve occupant satisfaction / productivity

Integrate research into pedagogy for participating subjects, students and industry practitioners (e.g., facility managers, startups)

Stanford University Land, Buildings & Real Estate

envairo

girls who code

Broaden participation in computing through collaborative hackathons

Scientific Impact

- ✚ Dissemination of new models/methods in leading cross-disciplinary journals
- ✚ Occupant classification and AR-feedback models extend to other cyber-physical systems where physical – human boundary is critical:
  - Power grid
  - Autonomous vehicles
  - Public transit
  - …

* Dollar by Shashank Singh, Feedback by Cuby Design, Factory by Nicholas DeForest, Autonomous Car by Effach, Transmission Tower by Stephen Plaster, Subway by Dan Hetteix, Green city by Chameleon Design, Learning by Gregor Cresnar from the Noun Project

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