High performance, multi-functional building envelopes integrated with lighting and thermal systems operation *(Thanos Tzempelikos, Panagiota Karava)*

Objectives:

- Use the models and multi-functional envelope concepts developed in Year 1 to enable sensing and integrated control of envelope, lighting and thermal systems
- Coordinated operation of envelope, lighting and thermal systems with BMS and optimized operation

Expected Results / Impact:

- New concepts and demonstration of total integrated control of perimeter building zones
- Integrated envelope/lighting/thermal systems with embedded sensing/control capabilities
- Maximized potential energy and IEQ benefits
- Design tools / new technology

Approach:

- New sensing/technologies and model-based controls for coordinated systems operation
- Simulation/emulation framework to evaluate overall system performance and impact on indoor environment
- Demonstration and validation in Living Labs, private offices

Schedule

- Months 1-6: Sensing and controls, integrated operation
- Months 6-12: Emulation and demonstration

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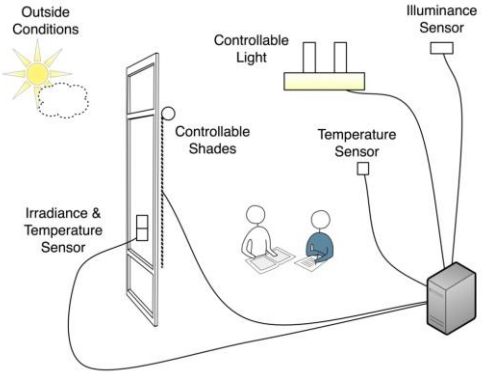
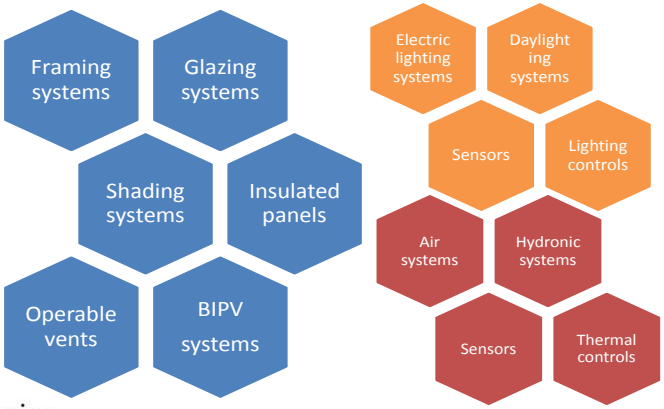
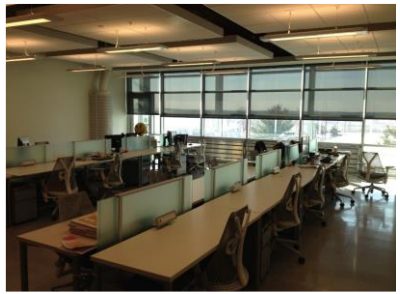
CHPB-10: High performance, multi-functional building envelopes integrated with lighting and thermal systems operation

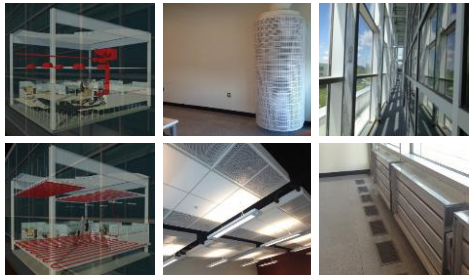
Sensing and controls





Demonstration and validation





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