Built Environment Science & Technology (BEST) Lab

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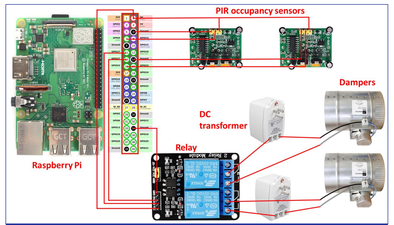
Mission

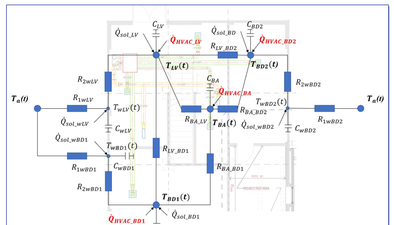
Built Environment Science & Technology (BEST) Lab is an interdisciplinary research group within Department of Mechanical and Aerospace Engineering, at Syracuse University focusing on design and implementation of advanced building controls, modeling and simulation of building energy supply and demand systems, indoor environment quality (IEQ), and human behaviors, and Fault detection and diagnostics (FDD) of HVAC systems. Our research spans the fields of mechanical engineering, computer science, architecture, electrical engineering, and operations research.

Scope of Research

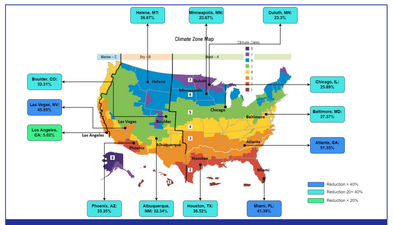
Building Retrofit and Sensing



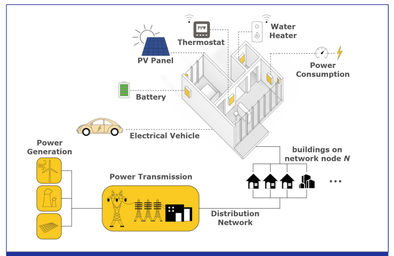
Energy Efficient Building Control



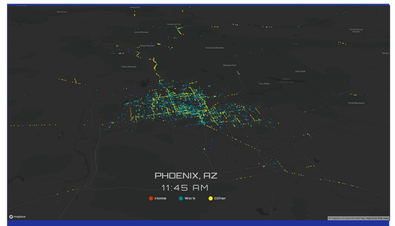
Energy Simulation



Intelligent Building Controls for Health and Energy Nexus



Urban Scale Building-to-Grid Study



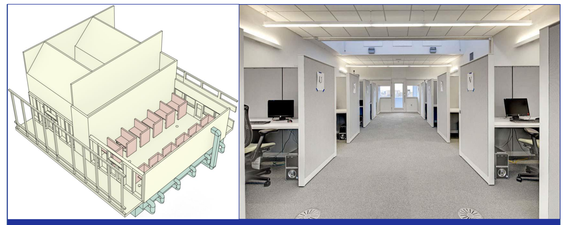
Urban-scale Human Mobility Study

Team Members

Dr. Bing Dong, Ph.D., Associate Professor, Director
Dr. Zhipeng Deng, Ph.D., Postdoctoral Researcher
Mr. Yapan Liu, Ph.D. Candidate
Mr. Yuewei Li, Ph.D. Student
Mr. Xuezheng Wang, Ph.D. Student
Mr. Zixin Jiang, Ph.D. Student
Mr. Pratik Pandey, Ph.D. Student

Capabilities and Services

Syracuse CoE Test Center



TIEQ – Side-by-Side Office Test Facility

Residential Test Facility

Selective Ongoing Projects

- National Science Foundation (NSF) CAREER - Holistic Assessment of the Impacts of Connected Buildings and People on Community Energy Planning and Management
- Department of Energy (DOE) - Energy Program Innovation Cluster for Equity and Health in Grid-interactive Efficient Buildings
- NSF (Collaborative Research) - Empirical Assessment of the Heterogeneous Changes in Electricity Consumption Behaviors Due to Co-Adopting Batteries, Electric Vehicles, and Solar Panels
- Honeywell Inc. - Honeywell Syracuse Next Generation IAQ Research
- ARPA-E: Quantification of HVAC Energy Savings for Occupancy Sensing in Buildings through An Innovative Testing Methodology.

Major Outputs

- Exploring Occupant Behavior in Buildings (Book)
- 2019 ASHRAE HVAC Applications Handbook (Book)
- Automated Diagnostics and Analytics for Buildings (Book)
- System for minimizing indoor infection risk and maximizing energy savings (Patent)
- Systems and methods for optimizing building-to-grid integration (Patent)
- Building and Building Cluster Energy Management and Optimization System and Method (Patent)
- Complete publications please refer to Google Scholar at: bit.ly/bingdong

Sponsors

ASHRAE · NSF · U.S. Department of Energy · NYSERDA · Marriott · arpa·e · cps Energy · Fiatech · Honeywell · Syracuse University

Collaborators

SyracuseCoE Syracuse University Environmental and Energy Systems · Lawrence Berkeley National Laboratory · BuildSim · Northeastern University · Oak Ridge National Laboratory · WELL Living Lab · Argonne National Laboratory · EBC · UTSA · Texas A&M Engineering · Carrier