# Laith Abdulmajeid

- **Degree**: Masters of Science

- **Major**: Mechanical Engineering

- **Advisors**: Mike Wagner, Gregory Nellis, and Douglas Reindl

- **Office**: 1337 ERB

- **Email**: abdulmajeid@wisc.edu

- **Hometown**: Jeddah, Saudi Arabia

- **Research**: Modeling and Controls of the Intelligent Building Agents Laboratory (IBAL)

Motivation and Background

- Buildings account for approximately 40% of the U.S. total energy demand and are responsible for 36% of national CO_2 emissions

- Energy consumption optimization is one path to increase building efficiency and comfort that would lead to net-zero energy buildings

- The National Institute of Standards and Technology designed the IBAL to emulate a small commercial building. Its purpose is to develop, exercise, and optimize advanced HVAC control strategies in a controlled setting

The **Intelligent Building Agents Lab:** a **building** in a **laboratory**
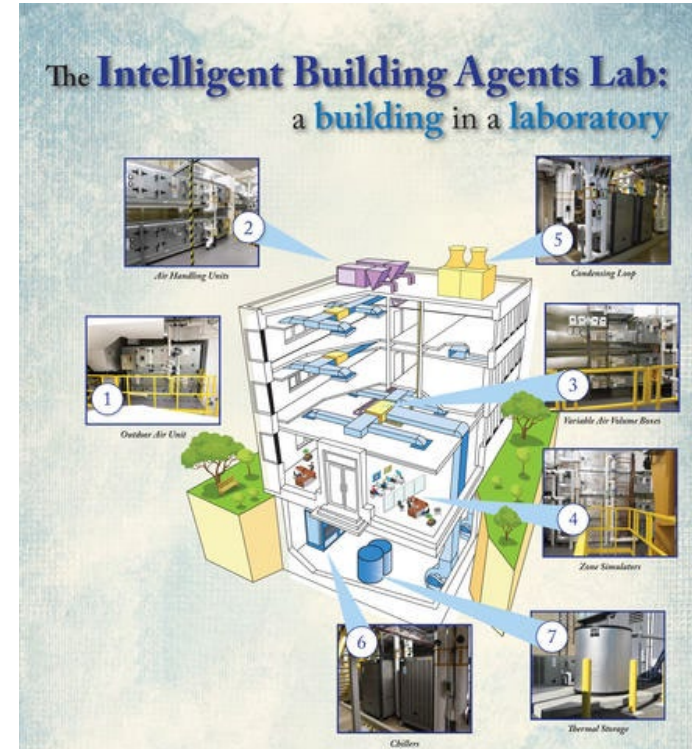
Objectives

- Model the performance and response of the IBAL in a TRNSYS simulation

- Validate the IBAL TRNSYS model against the physical IBAL system

- Implement the IBAL's existing control logic in the TRNSYS simulation

- Develop intelligent controls and optimization strategies for the IBAL using the TRNSYS model