



Environmental Science Graduate Program Seminar Series



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Dr. Clark received his PhD in Civil, Architectural, and Environmental Engineering and an MS in Architectural Engineering from the University of Texas at Austin.

Dr. Jordan Clark holds a majority appointment in the Department of Civil, Environmental, and Geodetic Engineering and a minority appointment in the Department of Food, Agricultural and Biological Engineering. He is also a member of the Sustainable and Resilient Economy initiative at Ohio State, an interdisciplinary collaboration aimed at answering the challenges of a quickly changing world.

Dr. Clark investigates the physical processes affecting energy consumption, thermal environments, and air quality in sustainable buildings. Most recently his work has focused on how we might leverage the recent explosion in sensing technology, communication, and data analytics to optimize heating, ventilation and air-conditioning devices and create smarter, more energy-efficient, healthy buildings.

Jordan Clark

Assistant Professor, Food, Ag. & Bio. Engineering
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Cunz 330 | 11 - 9 -18 | 3:00 pm - 4:00 pm

Smart control of indoor environments in energy efficient homes

Proper ventilation of buildings is essential for occupant health and comfort, but it is also responsible for a significant portion of energy consumption in the developed world (around 4% of all energy consumed in the United States!). These competing motivations become especially pronounced as we tighten and improve building envelopes and reduce non-ventilation loads.

This study examines a method for providing adequate ventilation in homes while reducing energy consumption and peak electricity demand: “smart” control of ventilation through sensing of occupancy, airborne pollutant concentrations, outdoor environmental variables, and grid signals, and modulation of ventilation fans in response.

California energy efficiency standards are among the most progressive in the country and dedicated ventilation is now required in new California homes. In addition, there are questions in California regarding potential air-tightness requirements in new homes. For these reasons, we first conducted a detailed simulation study of advanced California homes with several Smart Ventilation Control strategies using recently developed simulation tools. We then look at how general some of these results are on a national scale through a less detailed second simulation campaign. Results show a promising path forward for providing for healthy indoor environments while minimizing energy consumption and peak electricity demand.