

Student Presentations for Dec 13 meeting

AU

“Current Research in HVAC&R at Auburn University ”

Lorenzo Cremaschi (Associate Professor in ME): Introduction of the new Building Energy Systems and Technologies Research Laboratory at Auburn University

“Increasing Energy Efficiency by Mitigating Frost Growth: Super-Hydrophobic, Super-Hydrophilic, and Biphilic Surface Coatings”

Ellyn Harges (PhD) & Burak Adanur (MS): This talk will present research conducted by our group on special coatings for mitigating and controlling frost growth on outdoor coils of heat pump systems.

“New Energy Efficient Nano Refrigerants: Thermodynamics and Heat Transfer During Two-Phase Flow Phase Change Phenomena”

Andrea Bigi (PhD) & Pratik Deokar (PhD): This presentation will show how research grade nanoparticles laden lubricants for compressors can be used and optimized for improving energy efficiency of air conditioning systems.

UAB

“Solar Decathlon Competition Update”

Scott Jones

“Solar/thermal engine”

David Gilmore, Scott Jones, Matthew England, Dustin Covington

“Personal Cooler redesign”

Ben Hodde, Sallie Latta, Payton Markle, Mike Reynolds

“Low-cost PIV system”

Lawrence Oldham, Ike King, Jonas Hudson, Marc Bentley

UAT

“Using Inverse Regression Models to Create Gray Box Models to Simulate Building Energy Usage”

Joseph Carpenter: Understanding and reducing energy usage in buildings is a major area of interests but in older buildings and industrial facilities, determining building parameters to create a simulated model is difficult. This study uses inverse regression models to determine building parameters (i.e. wall resistance and capacitance) to create a simple simulated building model. The goal of the study is to create simple simulated models from energy bills or limited energy usage data. After the simulated model is created different energy conservation measures, (i.e. improved COP or insulation) can be analyzed for energy and cost savings.

“Demand Control Ventilation for a Single Duct VAV system with Multiple Zones: a case study”

Yanfei Li: This ASHRAE RP-1747 RP evaluated the demand control ventilation (DCV) for a single-duct VAV system with multiple zones using a whole building energy simulation platform (i.e., EnergyPlus) following the ASHRAE standard 62.1. The implemented DCV control logic is revised based on ASHRAE RP-1547. This update aims to make the DCV more robust and easier for online implementations in traditional HVAC DDC systems. An office building was modeled in 4 climate zones (i.e., Chicago, Atlanta, Oakland, Miami). The energy savings with DCV for each climate zone are demonstrated and compared with the traditional non-DCV ventilation strategy.