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Jordan D. Clark

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EDUCATION

Ph.D., Civil, Architectural, and Environmental Engineering, University of Texas at Austin, 2014
M.S., Architectural Engineering, University of Texas at Austin, 2010
B.S., Civil Engineering, Stevens Institute of Technology, 2005
B.A., Philosophy, Stevens Institute of Technology, 2005

PROFESSIONAL EXPERIENCE

Assistant Professor in Sustainable Buildings
College of Engineering, The Ohio State University, Columbus, OH 2018-PRESENT
Responsible for developing engineering research program and curriculum in building energy efficiency and indoor air quality, obtaining research funding, building and managing laboratory and research group, performing national and university service, and teaching undergraduate and graduate students

Projects and key accomplishments:
ASHRAE 1756-RP: Low-cost particulate matter sensors for smart building applications

- Leading laboratory and field testing of low-cost particle sensors
- Leading simulation efforts to develop control strategies and performance metrics for smart ventilation control

Postdoctoral Fellow
Lawrence Berkeley National Laboratory 2017
Responsible for designing and building experiments, collecting, analyzing, and synthesizing data, correlating findings with extant theory, presenting findings, creating design tools and energy models

Projects and key accomplishments:
Smart Ventilation for Advanced California Homes

- Created simulation tools to co-simulate thermal processes, HVAC operation, and airflow California residences
- Quantified energy savings available with smart control of ventilation devices in residences

Development of Method of Test for Kitchen Ventilation Devices

- Conducted laboratory evaluations of kitchen ventilation devices for development of standardized method of test for energy-efficient and high pollutant-capture kitchen ventilation devices

Lead Technical Specialist
CPP Wind Engineering, Fort Collins, CO 2016
Responsible for designing experiments, conducting building airflow simulations, analyzing data, conducting and presenting research, managing clients, drafters and technicians

- Managed >$1 million of engineering services per year
- Defined method for predicting wind-driven natural ventilation through modeling and experiments
- Conducted building airflow and contaminant transport analyses for naturally ventilated buildings
- Optimized laboratory exhaust systems to save an average of 15% of whole-building energy costs
- Conducted field testing, diagnostics and troubleshooting of laboratory exhaust fan systems

Postdoctoral Researcher and PhD Intern
National Renewable Energy Laboratory, Golden, CO 2012-2015
Responsible for designing and building experiments, collecting, analyzing, and synthesizing data, correlating findings with extant theory, presenting findings, creating design tools and energy models

Projects and key accomplishments:
Liquid Desiccant Air Conditioning Systems

- Created and validated first-principles model of heat and mass transfer in liquid desiccant air conditioner and regenerator
- Implemented object-oriented dynamic system model in Modelica and interfaced with EnergyPlus
- Determined energy savings potential of systems in commercial buildings in USA
- Used Computational Fluid Dynamics to analyze new and existing concepts for heat and mass transfer enhancement in Desiccant-Enhanced Evaporative Air Conditioning system

Supermarket Demand-Response

- Demonstrated thermal energy storage of refrigerated display cases in the Pacific Northwest
- Conducted experiments to measure heat transfer in refrigerated display cases and create model

Supermarket Air Conditioning

- Created site-specific HVAC equipment selection guide for grocery and retail owners in the USA
- Created object-oriented model of novel air conditioning systems and interfaced with building

Fabric Shelter Modeling

- Specified energy efficiency measures for U.S. Department of Defense shelters
- Created simple models of heat transfer and infiltration in fabric shelters

Graduate Research Assistant
University of Texas at Austin, Austin, TX 2009-2012
Responsible for designing and building experiments, collecting, analyzing, and synthesizing data, correlating findings with extant theory, presenting findings, securing research funding

ASHRAE RP 1546: Expansion and Updating of the ADPI Method

- Conceived, wrote entire proposal for, and won 140,000$ project
- Designed statistical method to analyze air distribution for over 100 diffuser types
- Built, conducted, and analyzed experiments to measure air distribution

NSF Integrative Graduate Education and Research Traineeship (IGERT)

- Designed, built and conducted experiments to quantify mass transfer to indoor surfaces
- Tested and analyzed low-energy stand-alone particle removal devices

ASHRAE RP 1416: Development of Internal Surface Convection Correlations for Energy and Load Calculation Methods

- Conducted experiments to characterize heat transfer for load calculation and energy modeling
- Developed semi-empirical model of fluid motion and heat transfer in buoyant jets

Junior Engineer, New York, NY 2006-2009
SI Engineering, MTA East Side Access Project

AWARDS

National Science Foundation IGERT Traineeship
Raymond Fillmore Dawson Endowed Fellowship in Engineering
NSF GRFP Honorable Mention
ASHRAE Grant-In-Aid
Temple Fellowship

PEER-REVIEWED JOURNAL ARTICLES AND TECHNICAL REPORTS

Published

Sadrizadeh, S., J. Pantelic, M. Sherman, J. Clark, and O. Abouali, “Airborne particle dispersion to an operating room environment during sliding and hinged door opening”, *Journal of Infection and Public Health* (2018), In press

Guyot, G., I. Walker, M. Sherman, and J. Clark, (2017) "Residential smart ventilation: A review." *LBNL/201056*

Liu. S., J. Clark, and A. Novoselac (2016) "Air diffusion performance index (ADPI) of overhead-air- distribution for diffusers at low cooling loads." *Energy and Buildings* 134

Clark, J. (2015) "Energy-efficient supermarket heating, ventilation and air conditioning in humid climates in the United States." *NREL/TP 5500-63796*

Hirsch, A., J. Clark, M. Deru, K. Trenbath, I. Doebber, and D. Studer (2015) "Pilot testing of commercial refrigeration-based demand-response." *NREL/TP 5500-6509*

E. Kozubal, M. Deru, L. Hermann, J. Clark, and A. Lowenstein, (2014) "Low-flow liquid desiccant air-conditioning: demonstrated performance and cost implications." *NREL/TP-5500-60695*

Kozubal, E., M. Deru, L. Hermann, and J. Clark (2014) "Low-flow liquid desiccant air conditioning: General guidance and site considerations." *NREL/TP-5500- 60695*

Clark, J. and A. Novoselac (2013) "Flow and mixed convection heat transfer in buoyant jets from floor registers.” Energy and Buildings." *Energy and Buildings* 61, 140-145.

Clark, J., L. Peeters and A. Novoselac (2013) "Experimental study of convective heat transfer from windows with Venetian blinds." *Building and Environment* 59, 690 - 700.

Clark, J., K. Goldstein, L. Peeters, and A. Novoselac, (2012) "Development of Internal Surface Convection Correlations for Energy and Load Calculations Methods." RP-1416, ASHRAE, Atlanta, GA

Submitted and in submission.

Clark, J., I. Walker, and G. Rojas, "Towards the development of a standardized testing protocol for overhead island kitchen exhaust devices: procedures, measurements and paths forward." Submitted to Building and Environment March 2018

Less, B., I. Walker, S. Dutton, X. Li, and J. Clark, "Energy savings and air quality improvement available with temperature-based smart ventilation control in advanced CA homes." in submission to Energy and Buildings summer 2018

Dutton, S., B. Less, I. Walker, X. Li, and J. Clark, "Co-simulation of airflow and energy simulation software for dynamic control of ventilation in buildings." in submission to Building Simulation summer 2018

Clark, J., B. Less, I. Walker, S. Dutton, X. Li and M. Sherman 2017, "Efficacy of occupancy-based smart ventilation strategies in U.S. residences." In submission to Building and Environment summer 2018

CONFERENCE PRESENTATIONS

Clark, J., I. Walker, B. Less, S. Dutton, X. Li and M. Sherman, "Energy Savings Estimates and Simplified Indoor Air Quality Assessment for three Smart Ventilation Control Strategies in Single-family California Homes accepted to *ASHRAE Winter Conference 2019*

Walker, I., G. Rojas, and J. Clark, "Evaluating the Performance of Island Kitchen Range Hoods." Accepted to *AIVC Conference 2018*

Clark, J., I. Walker, and G. Rojas, "Measurements of pollutant capture performance of range-integrated downdraft kitchen ventilation devices and variables affecting measured perf." Accepted to *Indoor Air 2018*

Sadrizadeh, S., Rojas, G., Clark, J., Walker, I., and Sherman, M. Validated numerical simulations of wall-mounted kitchen range hood pollutant capture and sensitivity tests to inform development of a method of test". Accepted to *Indoor Air 2018*

Clark, J., Corsi, R., and Novoselac, A., "Energy efficient reduction of exposure to airborne particles while sleeping" Accepted to *Indoor Air 2018*

Clark, J. "Identifying and using façade pressures for natural ventilation rate calculations." *ASHRAE Winter Conference 2017*, Las Vegas, 2017

Clark, J. and A. Novoselac, 2013, "Modeling the effect of HVAC operation on transport of gaseous species to indoor surfaces." *ASHRAE Transactions* 119,YY1-YY9.

Clark, J. and A. Novoselac. "Modeling the Effect of HVAC Operation on Transport of Gaseous Species to Indoor Surfaces." *ASHRAE Annual 2013*, Denver, 2013

Clark, J., A. Novoselac and R. Corsi. "Assessment of Two Control Strategies for Reducing Human Exposure to Airborne Particles while Sleeping In Low-Energy Homes." *IAQ 2013*, Vancouver, 2013

Clark, J. and A. Novoselac. "Semi-Empirical Models for Interior Convective Heat Transfer in Perimeter Zones." *COBEE 2012*, Boulder, 2012