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Education and Training

University of Colorado at Boulder. *Doctor of Philosophy*, Civil, Environmental, and Architectural Engineering Department's Building Systems Program, May 1992. Dissertation topic: building HVAC and indoor air quality performance modeling.

The University of Texas at Austin. *Master of Science in Engineering*, December 1986. Major: Energy & Fluids, Minor: Engineering Mathematics. MS topic: energy source options

The University of Kansas. *Bachelor of Science in Architectural Engineering*, May 1985. A 5-yr. ABET-accredited engineering degree, HVAC/Solar option. *Bachelor of Environmental Design*, May 1985, Environmental Systems option.

Professional Engineer, by the mechanical exam, Kansas

Research and Professional Experience

The University of Kansas, Lawrence, Kansas. *Associate Professor of Civil, Environmental, and Architectural Engineering*, with continuous tenure, 8-98 to present. *Assistant Professor of Architectural Engineering*, 8-92 to 7-98.

National Renewable Energy Laboratory (NREL, formerly SERI), Golden, Colorado. 1-90 to 7-92. *Graduate Co-op*, Thermal Sciences and Engineering Branch, Industrial Technologies Division.

Sample Publications

“ABET Self Study Report,” for the KU Bachelor of Science in Architectural Engineering degree program, 2012-2013 ABET/EAC Review Cycle, June 25, 2012.

“Thermal and Economic Evaluation of Slab-on-Grade Insulation in Wood-Framed Buildings”. *ASCE Journal of Architectural Engineering*, vol 15.1, pp. 14-25, March 2009.

“Passive Solar Thermal” and “Active Solar Thermal”; two new “GreenTips” in the *ASHRAE Green Guide, 2nd Ed.* Butterworth-Heinemann, ISBN 1-933742-07-0, 2006.

“A User-Friendly Model and Coefficients for Slab-on-Grade Load and Energy Calculations.” *ASHRAE Transactions*, vol. 111(2), pp. 122-136, 2005.

Designer's Guide to Ceiling-Based Air Diffusion, with Dandan Zhu. ASHRAE, ISBN 1-931862-11-7, soft cover, 154 pages, 2002.

“Placement of Ventilation Air Intakes for Improved IAQ (RP-806),” with Kelly A. Moylan. *ASHRAE Transactions*, Vol. 105(1), pp. 71-79, 1999.

“Performance of Fixed, Air-Side Economizer, and Neural-Network Demand Control Ventilation in CAV Systems,” with C. T. Wu. *ASHRAE Transactions*, Vol. 104(2), pp. 234-245, 1998.

“Impact of Daylight Saving Time on Residential Energy Consumption and Cost.” *Energy and Buildings*, Vol. 25, Issue 1, pp. 63-68, 1997.

“A Sensitivity Study of Floor and Ceiling Plenum Energy Model Parameters (RP-787),” with Don Wolfe. *ASHRAE Transactions*, Vol. 103(1), pp. 16-30, 1997.

“Post-Occupancy Indoor Environmental Quality Evaluation of an Institutional Building,” with Craig A. Hillman. *The ASCE Journal of Architectural Engineering*, Vol. 2, No. 3, pp. 88-94, Sept. 1996.

“Hands-on Energy Audit Experience for Engineering Students,” with M. Clay Belcher. 1994 *Midwest Section ASEE Meeting Proceedings*.

Synergistic Activities

U.S. DOE’s Energy Analysis and Diagnostic Center (EADC)/Industrial Assessment Center (IAC).
Acting Director, 25 audits/reports, #397 to #421 (many authors), June to November 1993.

American Society of Heating, Refrigerating and Air-Conditioning Engineers. Fellow, and member of the College of Fellows; KU Student Branch Advisor; member of the Kansas City Chapter; past chair of TC 4.3 (Ventilation Requirements and Infiltration), voting member of TC 5.3 (Room Air Distribution), TC 4.1 (Load Calculation Data and Procedures) corresponding member; 2004 Distinguished Service Award recipient; 2007-8 chair of the Society’s Handbook Committee. Recipient of the ASHRAE New Investigator Award.

Energy and Buildings, member of the Editorial Board. An international technical journal, 2010 Impact Factor = 2.041 (4 of 53), Elsevier. 2010 to current.

Senior Design/Construction Projects (funded primarily by ASHRAE):

"Fan and System Effects Experimental Apparatus"

"Full-Scale Variable Air and Water Flow Wet Cooling Tower for Class Experiments"

"Direct Digital and Pneumatic Control of Ventilation and Energy Systems"

"Analysis, Design, and Construction of an Active Solar Thermal Energy System"

New Faces in Engineering (early career recognition program; former students):

Amanda (Curry) Bogner, 2005. ASHRAE finalist.

Cynthia Cogil, 2004. First National New Faces in Engineering winner.

Areas of Expertise Related to Energy Efficient Designs, Technologies, and Improvements

Load and Energy Calculations: Practical thermal comfort, psychrometrics, and energy management

HVAC&R Systems Design: Ventilation/IAQ, air distribution, fans, central equipment, insulation

Heat and Mass Transfer: Heat exchangers, heat recovery, coil/chiller/cooling tower performance

Plumbing, Piping, and Fire Protection Systems: Pump performance, optimal sizing, conservation

Solar-Thermal and PV Energy Systems: Site evaluation, system analysis and design, economics

Courses Taught at KU

HVAC&R analysis and design, fire protection, hydronic systems (plumbing/piping/pumps), solar energy systems, automatic controls, advanced energy analysis, engineering economics

Revised: 5/15/13