

ONE-PAGE SUMMARY

Zheng O'Neill, Ph.D., P.E.

Education

Ph.D. 2004 Oklahoma State University, Stillwater, OK
M.S. 2000 Tongji University, China

Current Position

J. Mike Walker '66 Associate Professor, Mechanical Engineering, Texas A&M University

Interests and Expertise

Thermal Energy Systems Design, Analysis, Modeling, Simulation, and Optimization; Intelligent Building Energy and Control Systems; Building-to-Grid Integration; Smart and Connected Community and Smart City; Ground Source Heat Pumps; Uncertainty Quantification in HVAC/R Systems and Buildings; Building Information Modeling and Its Applications in Building Operations

Awards and Distinctions

- Texas A&M *Engineering Genesis Award*. 2020
- Texas A&M *J. Mike Walker '66 Faculty Fellow II*. 2020-2022
- The University of Alabama *President's Faculty Research Award*. 2019
- ASHRAE *Distinguished Service Award*. 2019
- IBPSA-USA *Emerging Contributor Award*. 2018
- ASHRAE *Innovative Research Grant (IRG) Award*. 2017
- ASHRAE Birmingham Chapter *Educator of the Year*. 2016
- DOE Industrial Assessment Center *Junior Faculty Research Award*. 2015
- *Best Paper Award* for 2013 Building Simulation: An International Journal. 2013
- United Technologies Research Center *Outstanding Achievement Award*. 2010

Publications

- Book chapter: 1
- Journal papers: 49
- Refereed conference papers: 65
- Patent: 1

External Research Grants since 2014

- \$15.53 M (O'Neill's share: \$9.32 M)
- 33 projects funded by ARPA-E, ASHRAE, DOD, DOE, NSF, and private industry

Course Taught

- Heat Transfer; Thermal Engineering Survey
- Heating, Ventilating and Air-Conditioning Design; Principle of Building Energy Analysis
- Computational-based Engineering of Energy Systems (Building Modeling and Simulation)

Student/Postdoctoral Researcher Advising

- Ph.D. students: 11 (completed: 3, in progress: 8)
- MS students: 5 (completed: 5)
- Postdoctoral Research Associate: 3

Professional Services

Voting and Corresponding Members of various ASHRAE Technical Committees (TC)
Research Chair of ASHRAE TC 7.5 Smart Building Systems; *Program Chair* of TC 1.13 Optimization
Editorial Board, Journal of Building Performance Simulation (IBPSA Journal)
Associate Editor, Science and Technology for the Built Environment (ASHRAE's Research Journal)



Zheng D. O'Neill, Ph.D., P.E.

J. Mike Walker '66 Department of Mechanical Engineering,
Texas A&M University
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RESEARCH INTERESTS AND EXPERTISE

- Building Energy Systems Design, Analysis, Modeling, Simulation, and Optimization
- Intelligent Building Energy and Control Systems
- Smart Building Systems, Building-to-Grid Integration, and Grid-Interactive Efficient Buildings
- Whole Building Energy Diagnostics, Fault Detection and Diagnostics of HVAC/R Systems
- Smart and Connected Community and Smart City
- Well-being in the Built Environment
- Geothermal System and Ground Source Heat Pumps
- Uncertainty Quantification in HVAC/R Systems and Buildings
- Building Information Modeling (BIM) and Its Applications in Building Operations

CURRENT POSITION

Associate Professor Jan. 2020 –
Holder of the J. Mike Walker '66 Career Development Professorship Sep. 2020 –
J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University (TAMU)

EXPERIENCE

Adjunct Professor Jan. 2020 – Dec. 2020
Department of Mechanical Engineering, The University of Alabama (UA)

Associate Professor April 2018 – Dec. 2019
Department of Mechanical Engineering, The University of Alabama

Assistant Director May. 2014 – Dec. 2018
DOE Industrial Assessment Center, The University of Alabama

Adjunct Professor Oct. 2016 – Dec. 2018
Architectural Engineering, The University of Alabama

Assistant Professor Jan. 2013 – April 2018
Department of Mechanical Engineering, The University of Alabama

Principal Investigator, Staff Research Engineer/Scientist Oct. 2009 – Jun. 2013
United Technologies Research Center (UTRC), East Hartford, CT

Senior Research Engineer/Scientist Oct. 2006 – Sept. 2009
United Technologies Research Center, East Hartford, CT

Energy Analyst <i>Cimetrics Inc., Boston, MA</i>	Jan. 2005 – Oct. 2006
Graduate Researcher <i>Building and Environmental Thermal Systems Research Group, Oklahoma State University</i>	2000 – 2004
Mechanical Engineer/Project Manager <i>Gebrüder TROX GmbH, Shanghai, China</i>	1999 – 2000
Graduate Researcher <i>Thermal Engineering Department, Tongji University</i>	1997 – 2000
Mechanical Engineer <i>Tongji Construction Project Supervision and Management Company</i>	1996 – 1997

EDUCATION

Ph.D., Mechanical Engineering <i>Oklahoma State University, Stillwater, OK</i> Dissertation: <i>Modeling of Standing Column Wells in Ground Source Heat Pump Systems</i> Advisor: Dr. Jeffrey D. Spitler	Dec. 2004
M.S., Thermal Engineering <i>Tongji University, China</i>	Jan. 2000
B.S., Architectural Engineering, Mechanical Option (HVAC) <i>Shenyang Architectural and Civil Engineering Institute (SACEI), China</i>	Jul. 1996

AWARDS AND DISTINCTIONS

- Texas A&M *Engineering Genesis Award*. 2020
- Texas A&M *J. Mike Walker '66 Faculty Fellow II*. 2020-2022
- The University of Alabama *President's Faculty Research Award*. 2019
- ASHRAE *Distinguished Service Award*. 2019
- IBPSA-USA *Emerging Contributor Award*. 2018
- ASHRAE *Innovative Research Grant (IRG) Award*. 2017
- ASHRAE Birmingham Chapter *Educator of the Year*. 2016
- DOE Industrial Assessment Center *Junior Faculty Research Award*. 2015
- *Best Paper Award* for 2013 Building Simulation: An International Journal. 2013
- United Technologies Research Center *Outstanding Achievement Award*. 2010
- United Technologies Research Center *Patent Award*. 2009
- United Technologies Research Center *Great Job Award*. 2008, 2012
- ASHRAE *GIA Paper Award*. 2005
- *Honor of Distinguished Graduate*, Tongji University. 2000
- *Honor of Distinguished Graduate*, Chinese Department of Construction. 1996

SCHOLARSHIPS AND FELLOWSHIPS

- ASHRAE Graduate Student Grant-in-Aid (GIA) Award. 2003–2004
- DAIKIN Air-Conditioning Scholarship, Tongji University. 1999

- GAOYI Air-Conditioning Scholarship, SACEI. 1995, 1996
- Distinguished Student Scholarship, First place, SACEI. 1993,1994,1995,1996

PROFESSIONAL REGISTRATION

Registered Professional Engineer, State of Ohio, License # 70914

PROFESSIONAL SOCIETIES AND SERVICE

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), 2000
 - Research Chair of TC 7.5 Smart Building Systems (2020–present)
 - Secretary of TC 7.5 Smart Building Systems (2018–2020)
 - Voting Member for TC 7.5 Smart Building Systems (2010–2014, 2017–2021)
 - Subcommittee Chair of TC 7.5 Subcommittee Building Operation Dynamics (2017–2018)
 - Voting Member of TC 1.13 Optimization (2014–2018, 2020–Present)
 - Program Chair of TC 1.13 Optimization (2013–present)
 - Voting member of MTG Occupant Behaviors in Buildings (2017–present)
 - Corresponding Member of TC 1.4 Control Theory and Application (2012 –present)
 - Corresponding Member of TC 1.5 Computer Application (2006–present)
 - Corresponding Member of TC 2.10 Resilience and Security (2018–present)
 - Corresponding Member of TC 4.3 Ventilation Requirements and Infiltration (2012–present)
 - Corresponding Member of TC 4.7 Energy Calculations (2002–present)
 - Corresponding Member of TC 9.2 Industrial Air-Conditioning (2016–present)
 - Corresponding Member of TC 10.7 Commercial Food Display and Storage Equipment (2007–present)
 - Faculty advisor for ASHRAE student chapter at the University of Alabama (2013–2019)
- International Building Performance Simulation Association, 2000
 - Member of IBPSA-USA Board of Directors, 2011–2013
 - Chair of IBPSA-USA Student Scholarship Committee, 2012 –2014
- American Society of Mechanical Engineers (ASME), 2000–present
- Society of Women Engineers (SWE), 2004–present
- Association for Computing Machinery, 2016–present
- Advisory Board, Industrial Assessment Center Women for Energy Efficiency (WE²), 2018–2020
- Editorial Board, Journal of Building Performance Simulation, 2019–present
- Associate Editor, Science and Technology for the Built Environment, 2019–present

EDUCATIONAL ACTIVITIES

Course Taught at TAMU

(1) MEEN 437: Principle of Building Energy Analysis Fa 2020 (34^a)

Course Taught at UA (~800 students)

(6) ME309: Heat Transfer Sp 2013 (57), Sp 2014 (76), Fa 2014 (70)
Fa 2015 (88), Fa 2016 (89), Fa 2017 (85)

(7) ME407: HVAC Fa 2013 (44), Fa 2014 (21), Fa 2015 (27),
Fa 2016 (25), Fa 2017 (45), Fa 2018(34)
Fa 2019 (40)

(1) ME216: Thermal Engineering Survey Spring 2018 (85)

(3) ME491/591: Computational Based Engineering of Energy Systems Sp 2015(11), Sp 2017(9), Sp 2019 (17)

^a number of students

Senior Capstone Design Projects (UA) – Sponsors and Competitions

Year	Sponsor	Title	Amount	Design Teams	Students
2014-2015	ASHRAE	A Solar Powered Ground Source Heat Pump Systems	\$5,000	2	10
2016-2017	ASHRAE	Building Energy Audits Using Unmanned Aerial Vehicles	\$5,000	1	7
2018-2019	ASHRAE	Design and Construction of a Guarded Hot Box for Thermal Performance Evaluations of Building Envelope	\$5,000	1	7

Course Development – UA ME491/591 “Computational Based Engineering of Energy Systems”

- Introduce the fundamentals of building energy modeling and simulation, and the formulation of component and system models, numerical considerations, stability analysis, Reduced-order model (ROM) extraction, and hardware in loop (HIL) application, etc.
- Introduce EnergyPlus and OpenStudio for whole building performance simulation

STUDENT/ RESEARCH ASSOCIATE RESEARCH ADVISING

Postdoctoral Research Associate Advising

- Dr. Yangyang Fu, Grid-Interactive Efficient Buildings. March 15th, 2020- present
- Dr. Zhiyao Yang, Heat Pump Technologies. October 15th, 2020 – present

Research Associate Advising

- Dr. Arkasama Bandyopadhyay, Human-Building Integration, GSHP. September 1st, 2020 – present

Ph.D. Student Advising

	Name	Dissertation	Preliminary exam	Defense	Current Position
1)	Fuxin Niu (UA)	Uncertainty Quantifications and Operation Optimization of Buildings as Virtual Batteries for the Grid with High Penetrations of Renewables	09/09/2016	06/15/2017	Ingersoll Rand Trane
2)	Yanfei Li (UA)	An Innovative Fault Analysis Framework to Enhance Building Operations	09/26/2017	08/03/2018	ORNL
3)	Joseph Carpenter ^b (UA)	Using Inverse Regression Models to Create Gray Box Models for Industrial Facilities	03/31/2017	10/5/2018	UA instructor
4)	Defeng Qian ^b (UA)	Model-based Optimization of Solar Powered Ground Source Heat Pump Systems	12/04/2020	(08/2021)	

5)	Zhihong Pang	Development, Quantification, and Demonstration of Occupant-Centric Controls for Smart and Healthy Buildings	TBD	(12/2022)	
6)	Tao Yang	IoT Based Comfort Control and Fault Diagnostics System for Energy Efficient Homes	TBD	(12/2022)	
7)	Fan Feng	HVAC Optimization with Smart Building Fenestration	TBD	(05/2022)	
8)	Xing Lu	Grid-Interactive Efficient Building (GEBs)	TBD	(08/2021)	
9)	Caleb Calfa	Heat Pump with Grid Integration	TBD	(05/2025)	
10)	Guwei Li	TBD	TBD	(05/2025)	
11)	MengYuan Chu	TBD	TBD	(05/2023)	

^bco-advise with Dr. Keith Woodbury at UA

M.S. Graduate Student Advising

	<u>Name</u>	<u>Thesis</u>	<u>Defense</u>	<u>Current Position</u>
1)	Liu Liu (UA)	Energy Modeling and Calibration of a Mixed-use Building with Laboratories, Offices and Classrooms	10/18/2016	Atelier Ten
2)	Defeng Qian (UA)	Solar Powered Ground Source Heat Pump Systems	05/18/2017	UA Ph.D. Student
3)	Zhengwen Hao (UA)	Model-based Estimation on Building Envelope Infiltration	10/16/2018	Canada
4)	Aaron Henry (UA)	Development of A Hardware-in-the-loop Framework with Modelica for Energy Efficient Buildings	Summer 2020	Tetra Tech
5)	Ben Cottrell (UA)	Using Cooling Tower Data to Model the Best Approach Temperature	02/28/2020	Optimum Energy

Undergraduate Student Advising

	<u>Name</u>	<u>Project</u>	<u>Program</u>	<u>Date</u>
1)	Rob Grady (UA)	Development of an Energy Model for UA Residential Hall	CBHP	09/13 -12/2015
2)	Jacob Tucker (UA)	Energy Modeling using Google Sketchup/OpenStudio	Emerging Scholars	01/14-05/2014
3)	Zachary Reasoner (UA)	Building Performance Measurement		01/16-05/2016
4)	Blake Smith-Cortez	Water-source Heat Pump System		01/21 -present
5)	Angelo Casale	Water-source Heat Pump System		01/21 -present
6)	Astrid Doennem	Building Energy Modeling	MEEN 491h	01/21 -present

Ph.D. Dissertation Committees

	<u>Name</u>	<u>Dissertation</u>	<u>Advisor</u>	<u>Defense</u>
1)	Zhengwei Li ^c	Adaptable, Scalable, Probabilistic Fault Detection and Diagnostic Methods For the HVAC Secondary System	Fried Augenbroe	03/2012
2)	Xu Shen ^d	Location-Based Leading Indicators in BIM for Construction Safety	Eric Marks	02/22/2017
3)	Weilin Han ^d	Non-Technical Loss Fraud Detection in Smart Grid	Yang Xiao	04/07/2017
4)	Yuna Zhang ^c	Optimal Strategies for Demand Charge Reduction by Commercial Building Owners	Fried Augenbroe	05/02/2017
5)	Siyuna Song ^d	Construction Equipment Travel Path Visualization and Productivity Evaluation	Eric Marks	09/13/2017
6)	Ziye Liu ^d	Energy Consumption and Data-Driven Modeling of Milling Difficult-to-Machine Alloys	Yuebin Guo	12/06/2018
7)	Kristopher Harbin ^d	Decision Analysis for Post-Design Change Orders Regarding Space Usage	Gary Moynihan	11/2020
8)	Chris Hou ^e	Modeling and Optimization of Advanced Ground Source Heat Pump System	Hessam Taherian	11/15/2019
9)	Forooza Samadi ^d	Determining Heat Transfer Coefficients in Pipe Flow: Parameter Estimation, Inverse Problems, and Numerical Heat Conduction Solution Using Green's Function	Keith Woodbury	10/16/2020
11)	Di Lu ^c	Adapting Building Thermal Load Control: Potential, Strategy and Implementation	Fried Augenbroe	11/25/2020
12)	Zhangjie Chen	Device-free Fine-grained Occupancy Sensing using Low Resolution Thermopile Array Sensor and Deep Learning	Ya Wang	12/2020 (Proposal defense)

^cFrom Georgia Institute of Technology

^dFrom University of Alabama

^eFrom University of Alabama at Birmingham

MS Thesis Committees

	<u>Name</u>	<u>Thesis</u>	<u>Advisor</u>	<u>Defense</u>
1)	Zilai Zhao (UA)	Energy Performance Modeling of Cooling Towers	Keith Woodbury	10/17/2016
2)	Bo Lin (UA)	A Novel Demand Response Mechanism in Smart Community with Learning-based Neutral Network Modeling	Shuhui LI	10/25/2017

Student Awards

- Y. Li. 2014 ASHRAE/IBPSA-USA Building Simulation Conference Student Travel Award
- Y. Li. 2015 ASHRAE Energy Modeling Conference Student Travel Award
- Y. Li. 2015 International Building Performance Simulation Association (IBPSA) Student Travel Award, Building Simulation 2015 Conference, in Hyderabad, India
- Y. Li. 2017-2018. Graduate Council Fellowship, the University of Alabama

- Y. Li. 2017-2018. ASHRAE Grant-in-Aid Award
- J. Carpenter. 2015 IBPSA-USA Student Travel Scholarship. Building Simulation 2015 Conference, in Hyderabad, India.
- F. Niu. 2016-2017. ASHRAE Grant-in-Aid Award
- F. Niu. 2016-2017. Graduate Council Fellowship, The University of Alabama
- D. Qian. 2018-2019. Graduate Council Fellowship, The University of Alabama
- T. Yang. 2018-2019. Graduate Council Fellowship, The University of Alabama
- F. Feng. 2018-2019. Graduate Council Fellowship, The University of Alabama
- Z. Pang. 2019-2020. Graduate Council Fellowship, The University of Alabama
- X. Lu. 2019-2020. Graduate Council Fellowship, The University of Alabama
- Z. Pang. 2019. Outstanding PhD Research Award, Depart of Mechanical Engineering, UA

RESEARCH ACTIVITIES

External Research Grants Since 2014 (Total \$15,525,513 O'Neill Share \$9,320,094)

- 1) Title: RAPID: Smart Ventilation Control May Reduce Infection Risk for COVID-19 in Public Buildings
 Sponsor: National Science Foundation
 Period of Performance: 05/01/2020 to 04/30/2021
 Role: PI
 Total Amount: \$125,417, O'Neill's share: \$125,417

- 2) Title: 1817-RP: Long-Term Temperature Change of Ground Heat Exchangers.
 Sponsor: ASHRAE through Syracuse University
 Period of Performance: 09/01/2020 to 02/28/2022
 Role: Co-PI (TAMU PI)
 Total Amount: \$160,000, O'Neill's share: \$30,000

- 3) Title: Securing Grid-interactive Efficient Buildings (GEB) through Cyber Defense and Resilient System (CYDRES).
 Sponsor: Department of Energy/ Building Technologies Office (BTO)
 Period of Performance: 05/01/2020 to 04/30/2023
 Role: PI
 Total Amount: \$3,561,594, O'Neill's share: \$3,561,594

- 4) Title: Hardware-in-the-loop Laboratory Performance Verification of Flexible Building Equipment in a Typical Commercial Building.
 Sponsor: Department of Energy/ Building Technologies Office (BTO) through Drexel University
 Period of Performance: 05/01/2020 to 04/30/2023
 Role: Co-PI (TAMU PI)
 Total Amount: \$2,750, 000, O'Neill's share: \$587,499

- 5) Title: 1883-URP: Development of the ASHRAE Global Occupant Database
 Sponsor: ASHRAE through Syracuse University
 Period of Performance: 04/01/2020 to 09/30/2021
 Role: Co-PI (TAMU PI)
 Total Amount: \$60,603, O'Neill's share: \$7,544

- 6) Title: Collaborative Research: AccelNet: An International Network of Networks for Well-being in the Built Environment (IN2WIBE)
Sponsor: National Science Foundation
Period of Performance: 10/01/2019 to 09/30/2022
Role: PI
Total Amount: \$750,000, O'Neill's share: \$168,750
- 7) Title: IoT Based Comfort Control and Fault Diagnostics System (i-COMFORT) for Energy Efficient Homes
Sponsor: Department of Energy/ Building Technologies Office (BTO)
Period of Performance: 08/01/2019 to 12/31/2022
Role: PI
Total Amount: \$1,062,586, O'Neill's share: \$1,062,586
- 8) Title: Cost-Effective Thermally Activated Building Systems to Support a Power Grid System With High Penetrations of As-Available Renewable Energy Resources
Sponsor: Department of Energy/ Building Technologies Office (BTO)
Period of Performance: 08/15/2019 to 08/14/2022
Role: Co-PI (TAMU PI)
Total Amount: \$1,499,941, O'Neill's share: \$599,976
- 9) Title: Comprehensive Information Transfer Approaches for Advanced Building Controls and Management Projects
Sponsor: Department of Defense/ Environmental Security Technology Certification Program (ESTCP) Through Slipstream
Period of Performance: 09/01/2019 to 08/31/2020
Role: Co-PI (TAMU PI)
Total Amount: \$433,000, O'Neill's share: \$82,607
- 10) Title: PFI-RP: Data-Driven Services for High Performance and Sustainable Buildings
Sponsor: National Science Foundation
Period of Performance: 09/15/2018 to 08/31/2021
Role: PI
Total Amount: \$750,000, O'Neill's share: \$750,000
- 11) Title: Computer Simulation of a Hybrid Residential Ground Source Heat Pump System
Sponsor: DOE/ORNL
Period of Performance: 08/01/2018 to 05/31/2019
Role: PI
Total Amount: \$10,822, O'Neill's share: \$10,822
- 12) Title: 1814-TRP: Actual Energy Performance of Secondary Schools and Medium Offices Designed to Comply with ASHRAE Standard 90.1-2010
Sponsor: ASHRAE
Period of Performance: 09/01/2018 to 04/30/2021
Role: Co-PI (UA PI)
Total Amount: \$144,288, O'Neill's share: \$44,988

- 13) Title: 1819-TRP: CO2 Demand Controlled Ventilation in Multiple Zone VAV Systems with Multiple Recirculation Paths
Sponsor: ASHRAE
Period of Performance: 09/01/2018 to 06/30/2020
Role: PI
Total Amount: \$96,149, O'Neill's share: \$96,149

- 14) Title: Collaborative Research: Adaptive, Multi-Layered Fenestration Elements for Optimum Building Energy Performance and Occupant Comfort
Sponsor: National Science Foundation
Period of Performance: 07/01/2018 to 06/30/2021
Role: PI
Total Amount: \$174,990, O'Neill's share: \$174,999

- 15) Title: Design and Construction of a Guarded Hot Box for Thermal Performance Evaluations of Building Envelope
Sponsor: ASHRAE
Period of Performance: 07/01/2018 to 05/31/2019
Role: PI
Total Amount: \$5,000, O'Neill's share: \$5,000

- 16) Title: Quantification of HVAC Energy Savings for Occupancy Sensing in Buildings Through an Innovative Testing Methodology
Sponsor: Advanced Research Projects Agency – Energy (ARPA-E)
Period of Performance: 08/16/2018 to 08/15/2021
Role: PI
Total Amount: \$1,496,655, O'Neill Share: \$897,993

- 17) Title: International Workshop on Connecting Woman Faculty in Sustainable Building Research
Sponsor: National Science Foundation
Period of Performance: 01/15/2018 to 01/14/2019
Role: Co-PI (UA PI)
Total Amount: \$50,000

- 18) Title: SCC-Planning: Smart, Connected, Engaged Senior Communities
Sponsor: National Science Foundation
Period of Performance: 09/01/2017 to 08/31/2019
Role: Co-PI (UA PI)
Total Amount: \$100,000

- 19) Title: Building Infiltration Estimator with Ultrasonic Thermometry (BLAST)
Sponsor: ASHRAE
Period of Performance: 09/01/2017 to 08/31/2019
Role: PI
Total Amount: \$150,000, O'Neill's share: \$90,000

- 20) Title: An Innovative Failure Analysis Framework to Enhance Building Design and Operations
Sponsor: ASHRAE

Period of Performance: 07/01/2017 to 06/30/2018
Role: PI
Total Amount: \$10,000, O'Neill's share: \$10,000

- 21) Title: Alabama Industrial Assessment Center: Training Students and Sustaining Industry
Sponsor: DOE
Period of Performance: 10/01/2016 to 09/30/2021
Role: Co-PI
Total Amount: \$1,350,000 O'Neill's share: \$175,500
- 22) Title: Collaborative Research: Multifunctional Structural Panel for Energy Efficiency and Multi-Hazards Mitigation
Sponsor: National Science Foundation
Period of Performance: 08/01/2016 to 07/31/2019
Role: Co-PI
Total Amount: \$249,890, O'Neill's share: \$124,945
- 23) Title: New Construction Guide Savings Analysis Update
Sponsor: New Buildings Institute
Period of Performance: 05/01/2016 to 10/31/2016
Role: PI
Total Amount: \$39,585, O'Neill's share: \$27,710
- 24) Title: Uncertainty Quantifications and Operation Optimization of Buildings as Virtual Batteries for the Grid with High Penetrations of Renewables
Sponsor: ASHRAE
Period of Performance: 07/01/2016 to 08/31/2017
Role: PI
Total Amount: \$10,000, O'Neill's share: \$10,000
- 25) Title: Building Energy Audits Using Unmanned Aerial Vehicles
Sponsor: ASHRAE
Period of Performance: 09/01/2016 to 05/31/2017
Role: PI
Total Amount: \$5,000, O'Neill's share: \$2,500
- 26) Title: 1702-RP Case Studies to Test Performance Measurement Protocols
Sponsor: ASHRAE
Period of Performance: 09/01/2015 to 08/31/2018
Role: Co-PI (UA PI)
Total Amount: \$160,701, O'Neill's share: \$43,402
- 27) Title: 1747-RP, Implementation of RP-1547 CO₂-based Demand Controlled Ventilation for Multiple Zone HVAC Systems in Direct Digital Control Systems
Sponsor: ASHRAE
Period of Performance: 09/01/2015 to 02/28/2017
Role: PI
Total Amount: \$181,779 (ASHRAE \$173,738, UA cost share \$8,041), O'Neill's share: \$173,738

- 28) Title: A Data-driven Approach for Estimation of Industrial Facility Energy Consumption
 Sponsor: DOE /AMO
 Period of Performance: 07/01/2015 to 06/30/2016
 Role: PI
 Total Amount: \$59,990, O'Neill's share: \$59,990
- 29) Title: Energy Performance Estimation of Industrial Cooling Tower
 Sponsor: DOE
 Period of Performance: 09/01/2015 to 05/31/2016
 Role: PI
 Total Amount: \$25,000, O'Neill's share: \$25,000
- 30) Title: A Solar Powered Ground Source Heat Pump System
 Sponsor: ASHRAE
 Period of Performance: 09/01/2014 to 05/31/2015
 Role: PI
 Total Amount: \$5,000, O'Neill's share: \$5,000
- 31) Title: EnergyPlus Model for PCR Study
 Sponsor: IGMA (Insulating Glass Manufacturers Alliance) and American Architectural
 Manufacturers Association (AAMA)
 Period of Performance: 06/01/2014 to 09/30/2015
 Role: PI
 Total Amount: \$12,700, O'Neill's share: \$12,700
- 32) Title: 1587RP-Control Loop Performance Assessment
 Sponsor: ASHRAE
 Period of Performance: 04/01/2014 to 03/31/2016
 Role: PI
 Total Amount: \$129,577 (ASHRAE \$110, 401, UA cost share \$19, 176), O'Neill's share: \$97,183
- 33) Title: Model Based Study of Adaptive Thermal Management for High Performance Buildings in
 the Southeast Using Thermal Mass
 Sponsor: The University of Alabama
 Period of Performance: 05/15/2013 to 05/14/2015
 Role: PI
 Total Amount: \$6,000, O'Neill's share: \$6,000
- 34) Title: Alabama Industrial Assessment Center: Training Engineers of Tomorrow
 Sponsor: DOE
 Period of Performance: 10/01/2014 to 09/30/2016
 Role: Co-PI
 Total Amount: \$449,605 O'Neill's share: \$112,401

Equipment and Software Donations

- 1) Carrier /Automated Logic Corporation, building controllers and WebCTRL, \$38,000, 2020

- 2) UTC Building and Industrial System/Automated Logic Corporation, building controllers and WebCTRL, \$34,570, 2014
- 3) Grundfos, 6 SQF-2 SQFlex Submersible Solar Pump, \$2,000, 2015

Other Funding

- 1) DOE EPSCoR Travel award, 2013, \$1,500
- 2) DOE EPSCoR Travel award, 2014, \$1,000
- 3) Southeastern Conference (SEC) Faculty Travel Grant, 2015, \$1,500
- 4) DOE EPSCoR Travel award, 2015, \$2,160

Selected Funded External Research Project at UTRC (out of more than \$10 M)

<u>Project</u>	<u>Sponsor</u>	<u>Amount (\$)</u>
1) Automated Continuous Commissioning of Commercial Buildings (PI)	DOD	1.3M
2) Scalable Deployment of Advanced Building Energy Management Systems (PI)	DOD	2.0M
3) Cost Effective Building Retrofit Through Robust Control and Scalable Algorithms (UTRC PI and Task 4.2 Optimal Controls lead)	DOE	1.5 M

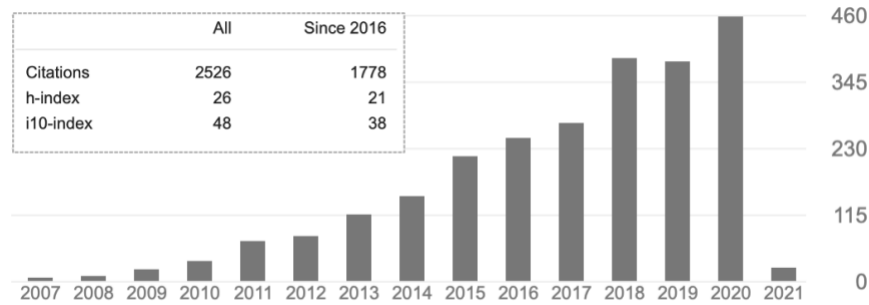
International Research Collaboration

<u>Project</u>	<u>Organizer</u>	<u>Participating Countries</u>
1) International Energy Agency (IEA) Annex 81 “Data Driven Smart Buildings” (2019- present)	IEA	25
2) IEA Annex 79 “Occupant Behaviour-Centric Building Design and Operation” (2019-present)	IEA	20
3) IBPSA Project 1 “BIM/GIS and Modelica Framework for building and community energy system design and operation” (2017-2022)	IBPSA	11
4) IEA Annex 66 “Definition and Simulation of Occupant Behavior in Buildings” (2013-2017)	IEA	24
5) IEA Annex 60 “New generation computational tools for building and community energy systems based on the Modelica and Functional Mockup Interface standards” (2012-2017)	IEA	16

PUBLICATIONS

Summary of Publications

- Google Scholar – 2,526 Citations, H index =26, i10-index = 48 (As January 24th, 2021)
- Book Chapter: 1
- Total Journal Papers (Published/In Print): 49
- Referred Conference Papers: 65



Annotations: ¹ Graduate Student, ² Postdoctoral Research Associate under my supervision
 *Corresponding Author

Book Chapters

- 1) O'Neill, Z.D., X. Pang, M. Shashanka, P. Haves and T. Bailey. 2014. Model-Based Real-time Whole Building Energy Performance Monitoring and Diagnostics, *Chapter 20. Automated Diagnostics and Analytics for Buildings*, B.L. Capehart and M.R. Brambley, eds., The Fairmont Press, Lilburn, Georgia.

Refereed Journal Publications

In Preparation

- 1) Li, Y.¹ and **Z.D. O'Neill**. Investigation of Fault Modeling Using a Whole Building Simulation Program.
- 2) Qian, D.¹, Z. Pang, X. Liu and **Z.D. O'Neill**. Validating and Quantifying A Modelica-based Dynamic Ground Loop Heat Exchanger Model.
- 3) O'Neill, C.R. and **Z.D. O'Neill**. Field Investigations of Nanoscale Particle Dispersion and Deposition Emitted from 3D Printers in Ventilated Spaces. To be submitted to *Building and Environment*.
- 4) Lu, X.¹ and **Z. D. O'Neill**. CO₂-based Demand Control Ventilation (DCV): A State-of-the-Art Review for the Past 20 Years. To be submitted to *Building and Environment*.
- 5) Lu, X.¹ and **Z. D. O'Neill**. Comprehensive Fault Impact Analysis and Robustness Assessment of the High-Performance Sequences of Operation for HVAC Systems. To be submitted to *Energy and Buildings*.
- 6) Pang, Z.¹, X. Lu¹ and **Z. D. O'Neill**. Mitigate the Infection Risk of COVID-19 in Indoor Spaces by Increasing the Amount of Outdoor Air.
- 7) Fu, Y.², **Z.D O'Neill**, et al. Grid Service Delivery Control in Grid-interactive Efficient Buildings: A Review on Commercial HVAC System.
- 8) Fu, Y.², **Z.D O'Neill**, et al. Modeling and Evaluation of Cyber-Attacks on Grid-Interactive Efficient Buildings.

In Review

- 9) Pang, Z.¹, **Z. D. O'Neill***, et al. 2021. Occupant's Well-being During Work from Home Under COVID-19 Pandemic: An International Survey. submitted to *Building and Environment*
- 10) Pang, Z.¹, Y. Chen, J. Zhang, **Z.D. O'Neill***, H. Cheng, and B. Dong. 2021 Quantifying The Nationwide HVAC Energy Savings in Large Hotels: The Role of Occupant-Centric Controls. submitted to *Journal of Building Performance Simulation*
- 11) Feng, F.¹, N. Kunwar, K. Cetin, and **Z. D. O'Neill***. 2021. A Critical Review of Fenestration/Window System Design and Operation in Buildings. submitted to *Energy and Buildings*
- 12) Lu, X.¹, V. Adetola, **Z. D. O'Neill***. 2021. Does Provisioning of Frequency Regulation Impact Building HVAC Quality of Service? – A Case Study with a Medium Office. submitted to *Energy and Buildings*.

- 13) Ye, Y., Y. Chen, J. Zhang, Z. Pang¹, **Z.D. O'Neill**, H. Cheng, and B. Dong. Energy-Saving Potential Evaluation for Primary Schools with Occupant-Centric Controls. 2021. Revision with *Applied Energy*.

Published/In Print (49)

- 14) Ye, Z., L. Zhang, Z. Chu, **Z.D. O'Neill**, and F. Hu. 2021. A Low-Cost Experimental Testbed for Energy-Saving HVAC Control Based on Human Behavior Monitoring. *International Journal of Cyber-Physical Systems (IJCPS)*. In Print
- 15) Awada, M, B. Becerik-Gerber, S. Hoque, **Z. D. O'Neill**, G. Pedrielli, J. Wen, T. Wu. 2020. Ten Questions Concerning Occupant Health in Buildings during Normal Operations and the COVID-19 Pandemic. *Building and Environment*. <https://doi.org/10.1016/j.buildenv.2020.107480>
- 16) Pang, Z.¹, Y. Chen, J. Zhang, **Z.D. O'Neill**, H. Cheng, and B. Dong. 2020. How Much HVAC Energy Could Be Saved from the Occupant-Centric Smart Home Thermostat: A Nationwide Simulation Study. *Applied Energy*. (2020): 116251. <https://doi.org/10.1016/j.apenergy.2020.116251>
- 17) Lu, X.¹, T. Yang¹, **Z. D. O'Neill**, X. Zhou and Z. Pang¹. 2020. Energy and Ventilation Performance Analysis for CO₂-based Demand-Controlled Ventilation in Multiple-zone VAV Systems with Fan-Powered Terminal Units (ASHRAE RP-1819), *Science and Technology for the Built Environment*. 27 (2): 139-157. <https://doi.org/10.1080/23744731.2020.1831318>
- 18) Pang, Z.¹, Y. Chen, J. Zhang, **Z.D. O'Neill**, H. Cheng, and B. Dong. 2020. Nationwide HVAC Energy-Saving Potential Quantification for Office Buildings with Occupant-Centric Controls in Various Climates. *Applied Energy*. 279 (2020): 115727 <https://doi.org/10.1016/j.apenergy.2020.115727>.
- 19) Pang, Z.¹, Niu, F., and **Z.D. O'Neill***. 2020. Solar Radiation Prediction Using Recurrent Neural Network. *Renewable Energy*. 156 (2020):270-289. <https://doi.org/10.1016/j.renene.2020.04.042>
- 20) Lu, X.¹, F. Feng¹, Z. Pang¹, T. Yang¹, and **Z. D. O'Neill***. 2020. Occupancy Counting from Social Media and its Integration with Building Energy Modeling. *Building Simulation: An International Journal*. <https://doi.org/10.1007/s12273-020-0637-y>
- 21) Lu. X.¹, Y. Li¹, F. Niu¹ and **Z. D. O'Neill***. 2020. A Novel Simulation-based Framework for Sensor Error Impact Analysis in Smart Building Systems: A Case Study for a Demand-Controlled Ventilation System. *Applied Energy*. 263 (2020). <https://doi.org/10.1016/j.apenergy.2020.114638>
- 22) Pang, Z.¹, **Z.D. O'Neill***, Y. Li and F. Niu. 2019. Rethinking the Role of Sensitivity Analysis (SA) in The Building Energy Assessment: Retrospect and Prospect. *Energy and Buildings*. 209 (2019) <https://doi.org/10.1016/j.enbuild.2019.109659>
- 23) Li, Y.¹ and **Z.D. O'Neill***. 2019. An Innovative Fault Impact Analysis Framework for Enhancing Building Operations. *Energy and Buildings*. 199 (2019):311-331. <https://doi.org/10.1016/j.enbuild.2019.07.011>
- 24) Dong, B., V. Prakash, F. Feng¹ and **Z.D. O'Neill**. 2019. A Review of Smart Building Sensing System for Better Indoor Environment Control. *Energy and Buildings*. 199 (2019):29-46. <https://doi.org/10.1016/j.enbuild.2019.06.025>
- 25) **O'Neill, Z.D. ***, Y. Li¹, H. Cheng, X. Zhou and S. Taylor. 2019. Energy Savings and Ventilation Performance from CO₂-based Demand Controlled Ventilation: Simulation Results from ASHRAE RP-1747. (ASHRAE RP-1747). *Science and Technology for the Built Environment*. 26 (2): 257-281. <https://doi.org/10.1080/23744731.2019.1620575>
- 26) Qian, D.¹, Y. Li¹, F. Nu¹ and **Z.D. O'Neill***. 2019. Nationwide Savings Analysis of a Variety of Energy Conservation Measures with Large Scale Simulations. *Energy Conversion and Management*. 188 (2019): 1-18. <https://doi.org/10.1016/j.enconman.2019.03.035>
- 27) Wang, L., X. Zhou and **Z.D. O'Neill**. 2018. Assessing the Validity, Reliability, and Practicality of ASHRAE's Performance Measurement Protocol (1702-RP). *Science and Technology for the Built Environment*. <https://doi.org/10.1080/23744731.2018.1561075>

- 28) Liu, R., Y. Li¹, **Z.D. O'Neill*** and X. Zhou. 2018. Development Control Quality Factor for HVAC Control Loop Performance Assessment II: Field Testing and Results (1587-RP). *Science and Technology for the Built Environment*. <https://doi.org/10.1080/23744731.2019.1576458>
- 29) Li, Y.¹ and **Z.D. O'Neill***. 2018. Development of Control Quality Factor for HVAC Control Loop Performance Assessment I: Methodology (1587-RP). *Science and Technology for the Built Environment*. <https://doi.org/10.1080/23744731.2018.1556055>
- 30) Pang, Z. ¹ and **Z.D. O'Neill***. 2018. Uncertainty Quantification and Sensitivity Analysis of The Domestic Hot Water Usage in Hotels. *Applied Energy*. 232 (2018):424-442. <https://doi.org/10.1016/j.apenergy.2018.09.221>
- 31) Li Y. ¹ and **Z. D. O'Neill***. 2018. A Critical Review of Fault Modeling of HVAC Systems in Buildings, *Building Simulation: An International Journal*. <https://doi.org/10.1007/s12273-018-0458-4>. - Invited Paper: 10 Years Anniversary.
- 32) Pang Z. ¹, X. Peng, **Z. D. O'Neill**, et al. 2018. Application of Mobile Positioning Occupancy Data for Building Energy Model Calibration: An Engineering Case Study. *Building and Environment*. 141: 1-15.
- 33) Zhou, S., **Z.D. O'Neill** and C.R. O'Neill. 2018. A Review of Leakage Detection Methods for District Heating Networks. *Applied Thermal Engineering*. 137(2018):567-574. <https://doi.org/10.1016/j.applthermaleng.2018.04.010>
- 34) Carpenter, J.¹, K. A. Woodbury, and **Z. D. O'Neill**. 2018. Using Change-Point and Gaussian Process Models to Create Baseline Energy Models in Industrial Facilities: A Comparison. *Applied Energy*. 213:415-425. <https://doi.org/10.1016/j.apenergy.2018.01.043>
- 35) Niu, F.¹, **Z.D. O'Neill*** and C.R. O'Neill. 2018. Data-Driven Based Estimation of HVAC Energy Consumption with An Improved Fourier Series Decomposition in a University Dormitory. <https://doi.org/10.1007/s12273-018-0431-2>. *Building Simulation: An International Journal*.
- 36) Golden, A., K. A. Woodbury, J. Carpenter¹ and **Z. D. O'Neill**. 2017. Change Point and Degree Day Baseline Regression Models in Industrial Facilities. *Energy and Buildings*. <https://doi.org/10.1016/j.enbuild.2017.03.024>
- 37) **O'Neill, Z. D. *** and F. Niu¹. 2017. Uncertainty and Sensitivity Analysis of Spatio-temporal Occupant Behaviors on Residential Building Energy Performance Utilizing Karhunen-Loève Expansion. *Building and Environment*. 115 (2017): 157-172. <http://dx.doi.org/10.1016/j.buildenv.2017.01.025>
- 38) Cetin, K. S. and **Z.D. O'Neill**. 2017. Smart Meters and Smart Devices in Buildings: A Review of Recent Progress & Their Influence on Electricity Use and Peak Demand. *Current Sustainable/Renewable Energy Reports*. 4(1):1-7. <https://doi.org/10.1007/s40518-017-0063-7>
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- 40) Chaudhary, G., J. New, J. Sanyal, P. Im, **Z.D. O'Neill** and V.I Garg. 2016. Evaluation of "Autotune" Calibration against Manual Calibration of Building Energy Models. *Applied Energy*. 82:115-134. <http://dx.doi.org/10.1016/j.apenergy.2016.08.073>
- 41) Niu, F. ¹, X. Liu and **Z.D. O'Neill***. 2016. Model-Based Energy Comparison Performance Analysis of Pumping System performance with Different Control Logics. *ASHRAE Transactions*.122 (2): 173-185.
- 42) Zhang, D., S. Li, M. Sun and **Z.D. O'Neill**. 2016. An Optimal and Learning-Based Demand Response and Home Energy Management System. *IEEE Transactions on Smart Grid*. 7(4): 1790-1801.

- 43) **O'Neill, Z.D.*** and C. R. O'Neill. 2016. Development of a Probabilistic Model for Estimating Building Energy Performance. *Applied Energy*. 164 (2016) 650–658. dx.doi.org/10.1016/j.apenergy.2015.12.015.
- 44) Li, P., D. Vrabie, D. Li, S. Bengea, S. Mijanovic and **Z. D. O'Neill**. 2015. Simulation and Experimental Demonstration of Model Predictive Control in a Building HVAC System. *Science and Technology for the Built Environment*. 21(6):721-732. DOI: 10.1080/23744731.2015.1061888.
- 45) Zhang, Y.¹, **Z.D. O'Neill**, B. Dong and G. Augenbroe. 2015. Comparisons of Inverse Modeling Approaches for Predicting Building Energy Performance. *Building and Environment*. 86 (2015): 177-190. doi:10.1016/j.buildenv.2014.12.023.
- 46) **O'Neill, Z.D.*** and S. Narayanan. 2014. Model Based Estimation of Cold Room Temperatures in Supermarket Refrigeration System. *Applied Thermal Engineering*. 73(2014):819-830 DOI: 10.1016/j.applthermaleng.2014.08.038.
- 47) Dong B., **Z.D. O'Neill**, D Luo and T. Bailey. 2014. Development and Calibration of an On-line Energy Model for Campus Buildings. *Energy and Buildings*. Volume (76):316-327. DOI: 10.1016/j.enbuild.2014.02.064.
- 48) Dong B., **Z.D. O'Neill** and Z. Li¹. 2014. A BIM Enabled Information Infrastructure for Building Energy Fault Detection and Diagnostics. *Automation in Construction*. Volume (44):197-211. (IF: 2.919)
- 49) **O'Neill, Z.D.***, X. Pang, M. Shashanka, P. Haves and T. Bailey. 2014. Model-Based Real-time Whole Building Energy Performance Monitoring and Diagnostics. *Journal of Building Performance Simulation*. 7(2):83-89. DOI:10.1080/19401493.2013.777118.
- 50) Li, S., D. Zhang, A. Roget and **Z.D. O'Neill**. 2013. Integrating Home Energy Simulation and Dynamic Electricity Price for Demand Response Study. *IEEE Transactions on Smart Grid*. Volume PP(99): 1-10. DOI: 10.1109/TSG.2013.2279110.
- 51) **O'Neill, Z.D.***, T. Bailey, B. Dong, M. Shashanka and D. Luo. 2013. Advanced Building Energy Management Systems Demonstration for Department of Defense Buildings. *Annals of the New York Academy of Sciences*. 1295(2013):44-53. DOI 10.1111/nyas.12188.
- 52) **O'Neill, Z.D.*** and B. Eisenhower. 2013. Leveraging the Analysis of Parametric Uncertainty for Building Energy Model Calibration. *Building Simulation: An International Journal*. 6(4):365-377. DOI 10.1007/s12273-013-0125-8. (**Best Paper Award for 2013**)
- 53) Dong B., M. Gorbounov, S. Yuan, T. Wu, A. Srivastav, T. Bailey and **Z.D. O'Neill**. 2013. Integrated Energy Performance Modeling for A Retail Store Building. *Building Simulation: An International Journal*. DOI:10.1007/s12273-013-0109-8.
- 54) Sun, B.¹, P. Luh, Q. Jia, **Z.D. O'Neill** and F. Song. 2013. Building Energy Doctors: An SPC and Kalman Filter-based Method for System-Level Fault Detection in HVAC Systems. *IEEE Transactions on Automation Science and Engineering*. 99: 1-15. DOI: 10.1109/TASE.2012.2226155
- 55) Eisenhower, B., **Z.D. O'Neill**, S. Narayanan, V. A. Fonoberov and I. Mezic'. 2012. A Methodology for Meta-model Based Optimization in Building Energy Models. *Energy and Buildings*. 47:292-302 DOI:10.1016/j.enbuild.2011.12.001.
- 56) Eisenhower, B., **Z.D. O'Neill**, V. Fonoberov and I. Mezic'. 2012. Uncertainty and Sensitivity Decomposition of Building Energy Models. *Journal of Building Performance Simulation*. 5(3): 171-184. DOI: 10.1080/19401493.2010.549964.
- 57) Sun, B.¹, P. Luh and **Z.D. O'Neill**. 2011. SPC and Kalman Filter-based Fault Detection and Diagnosis for an Air-cooled Chiller. *Frontiers of Electrical and Electronic Engineering in China*, 6(3):412-423. DOI 10.1007/s11460-011-0164-9.
- 58) **O'Neill, Z.D.** and J. D. Spitler. 2006. Performance Analysis of Single U-tube and Standing Column Well Ground Heat Exchangers. *ASHRAE Transactions*, 112(2): 633–643.
- 59) **Deng, Z.**, S. J. Rees and J. D. Spitler. 2005. A Model for Annual Simulation of Standing Column Well Ground Heat Exchangers. *HVAC&R Research*, Vol. (11)4:637–655.

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- 61) Rees, S. J., **Z. Deng** and J. D. Spitler. 2004. A Study of Geothermal Heat Pump and Standing Column Well Performance. *ASHRAE Transactions*, 110(1):3–13.
- 62) **Deng, Z.** and Q, Li 1999. Performance Analysis of Heat Reclaim Ventilation System. *Building Energy & Environment*. Vol. 18.

Refereed Conference Publications (66)

- 1) Xu, S., Y. Wang, Y. Z. Wang, **Z. O’Neill** and Q. 2020. One for Many: Transfer Learning for Building HVAC Control. *ACM BuildSys 2020*. November 14, 2020.
- 2) Lu, X.¹, **Z.D. O’Neill**, X. Zhou, and T. Yang. 2020. Energy and Ventilation Performance Analysis for CO₂-based Demand-Controlled Ventilation in Multiple Zone VAV systems with Multiple Recirculation Paths. *2020 ASHRAE Building Performance Analysis Conference and SimBuild*, Chicago, IL. August 12 – 14, 2020.
- 3) Pang, Z.¹, Y. Chen, J. Zhang, **Z.D. O’Neill**, and Y. Xie. 2020. Development of Baseline Building Energy Models for the Advanced Occupant-Centric Building Control Research in the Various U.S. Climates. *2020 ASHRAE Building Performance Analysis Conference and SimBuild*, Chicago, IL. August 12 – 14, 2020.
- 4) Pang, Z.¹, Y. Chen, **Z.D. O’Neill**, J. Zhang, H. Cheng, and B. Dong. 2020. Nationwide Energy Saving Analysis for Office Buildings with Occupant Centric Building Controls. *2020 ASHRAE Annual Virtual Meeting*. Austin, TX. June 27 – July 1, 2020.
- 5) Qian, D.¹, X. Liu, and **Z.D. O’Neill**. 2020. A Simulation-based Investigation On the Performance Of A Hybrid Ground Source Heat Pump System Integrated With Thermal Energy Storage. *2020 ASHRAE Annual Virtual Meeting*. Austin, TX. June 27 – July 1, 2020.
- 6) Ye, Z.¹, L. Zhang, Z. Chu, **Z.D. O’Neill**, and F. Hu. 2020. Hardware-Based Emulator for Building Energy Cyber-Physical Control with Occupancy Sensing. The 17th International Conference on Information Technology: New Generations. ITNG 2020. Las Vegas, NV, USA. April 5 – 8, 2020.
- 7) Lu, X.¹, F. Feng¹, and **Z.D. O’Neill**. 2020. Occupancy Sensing in Buildings through Social Media from Semantic Analysis. *2020 ASHRAE Winter Meeting*. Orlando, FL. February 1 – 5, 2020.
- 8) Pang, Z.¹, Y. Chen, J. Zhang, **Z.D. O’Neill**, H. Cheng, and B. Dong. 2020. Nationwide Energy Saving Potential Evaluation for Office Buildings with Occupancy-Based Building Controls. *2020 ASHRAE Winter Meeting*. Orlando, FL. February 1 – 5, 2020.
- 9) Lu, X., F. Feng, and **Z.D. O’Neill**. 2019. Acquisition of Typical Occupancy Schedules for Commercial Buildings from Social Networks. In Proceedings of the *1st ACM International Workshop on Urban Building Energy Sensing, Controls, Big Data Analysis, and Visualization (UrbSys’19)*. ACM, New York, NY, USA, 77-81. DOI: <https://doi.org/10.1145/3363459.3363537>.
- 10) Pang, Z.¹ and **Z.D. O’Neill**. 2019. A Comparative Study of Various Sensitivity Analysis Methods in Building Application. *The 16th International Building Performance Simulation Association Conference and Exhibition*. Rome, Italy. September 2-4, 2019.
- 11) Pang, Z.¹, Y. Chen, C. Metzger, C. Dymond, **Z. D. O’Neill** and J. Zhang. 2019. Maximizing The Use Of Ductless Heat Pump Systems In Residential Buildings With Existing HVAC Equipment In EnergyPlus. *The 16th International Building Performance Simulation Association Conference and Exhibition*. Rome, Italy. September 2-4, 2019.
- 12) Li, Y.¹ and **Z.D. O’Neill**. 2019. Simulation Based Fault Impact Analysis for the Secondary School in the U.S. *2019 ASHRAE Annual Meeting*. Kansas City, MO. Jun 22–26, 2019.
- 13) Feng, F.¹, **Z.D. O’Neill** and P. Xu. 2019. An Automated Method to Identify The Expert Systems for Supervisory Controls in Building Systems. *2019 ASHRAE Annual Meeting*. Kansas City, MO. Jun 22–26, 2019.
- 14) Feng, F.¹ and **Z.D. O’Neill**. 2019. Identifying Models of HVAC Systems Using ARIMAX. *2019 ASHRAE*

- Annual Meeting*. Kansas City, MO. Jun 22–26, 2019.
- 15) Pang, Z.¹, and **Z.D. O’Neill**. 2019. A Case Study of Sensitivity Analysis of The Domestic Hot Water System in Large Hotels, *2019 ASHRAE Winter Meeting*. Atlanta, GA. Jan 12–16, 2019
 - 16) Qian, D.¹, and **Z.D. O’Neill**. 2018. Modelica-Based Dynamic Modeling of a Solar-Powered Ground Source Heat Pump System: A Preliminary Case Study. *American Modelica Conference 2018*. Cambridge, MA, October 9-10, 2018.
 - 17) Liu, L.¹, Z. Hao, F. Niu and **Z.D. O’Neill**. 2018. Energy Modeling and Calibration of a Mixed-use Building with Laboratories, Offices, and Classrooms. *2018 ASHRAE Building Performance Analysis Conference and SimBuild*, Chicago, IL. September 26-28, 2018.
 - 18) Hao, Z.¹ and **Z.D. O’Neill**. 2018. Model-based Estimation of Building Infiltration. *2018 ASHRAE Building Performance Analysis Conference and SimBuild*, Chicago, IL. September 26-28, 2018.
 - 19) Qian, D.¹, Z. Pang and **Z.D. O’Neill**. 2018. Evaluation of Low-cost Particulate Matter (PM) Sensors: A Preliminary Investigation, *2018 ASHRAE Annual Meeting*. Houston, TX. Jun 23–27, 2018.
 - 20) Li, Y.¹, F. Niu, D. Qian, and **Z.D. O’Neill**. 2018. Nationwide Energy Savings Analysis of Radiant Floor System for Commercial Buildings, *2018 ASHRAE Annual Meeting*. Houston, TX. June 23–27, 2018.
 - 21) Pang, Z.¹, X. Peng and **Z.D. O’Neill**. 2018. Application of Mobile-internet-based Occupancy Data in Building Energy Model Calibration: A Case Study, *2018 ASHRAE Annual Meeting*. Houston, TX. Jun 23–27, 2018.
 - 22) Carpenter, J.¹, K. A. Woodbury, and **Z.D. O’Neill**. 2018. Calculating Energy Savings on Air Conditioners in Industrial Facilities Using Simple Physics, *2018 ASHRAE Annual Meeting*. Houston, TX. Jun 23–27, 2018.
 - 23) Qian, D., Y. Li, F. Nu and **Z.D. O’Neill**. 2018. Nationwide Savings Analysis of A Variety of Energy Conservation Measures. *2018 ASHRAE Winter Meeting*. Chicago, IL. Jan 20–24, 2018.
 - 24) Niu, F.¹ and **Z.D. O’Neill**. 2017. Recurrent Neural Network based Deep Learning Solar Radiation Prediction. *The 15th International Building Performance Simulation Association Conference and Exhibition*. San Francisco, August 7–9, 2017.
 - 25) **O’Neill, Z.D.**, A. Henry¹ and C. R. O’Neill. 2017. Development of A Hardware-in-the-loop Framework with Modelica for Energy Efficient Buildings. *2017 ASHRAE Winter Meeting*. Las Vegas, NV. January 28–February 1, 2017.
 - 26) **O’Neill, Z.D.** and A. Henry¹. 2016. Development of a Hardware-in-the-loop Framework with Modelica for Energy Efficient Buildings: Poster Abstract. *Proceedings of the 3rd ACM International Conference on Systems for Energy-Efficient Built Environments*. Page 223-224. November 15-17, 2016, Stanford, CA, USA.
 - 27) Niu, F.¹, **Z.D. O’Neill**, X. Zhou and D. Qian¹. 2016. Model-based Optimal Control of a Building HVAC System. *International Compressor Engineering, Refrigeration and Air Conditioning, and High Performance Buildings Conferences*. West Lafayette, IN. July 11 - 14, 2016.
 - 28) Qian, D.¹, F. Niu¹, S. Kavanaugh and **Z.D. O’Neill**. 2016. Investigation on A Ground Source Heat Pump System Integrated with Renewable Sources. *International Compressor Engineering, Refrigeration and Air Conditioning, and High Performance Buildings Conferences*. West Lafayette, IN. July 11 - 14, 2016.
 - 29) Sterling, R., T. Mueller, A. Andriamamonjy, A. Giretti, M. Bonvini, **Z.D. O’Neill**, M. Wetter, M.V. Cavey, A. Costa¹, G. Boehme, W. Zuo, R. Klein, B. Dong and M.M. Keane. 2016. IEA annex 60 activity 2.3: model use during operation, approach and case studies. *Proceedings of the Building Simulation and Optimization 2016 Conference*, September 12-14, Newcastle, UK.
 - 30) Carpenter, J.¹, K.A. Woodbury and **Z.D. O’Neill**. 2016. A Comparison of Gaussian Process Regression and Chang-point Regression for the Baseline Model in Industrial Facilities. *ASHRAE and IBPSA-USA SimBuild 2016. Building Performance Modeling Conference*. Salt Lake City, UT. August 8-12, 2016.

- 31) Carpenter, J. ¹, **Z.D. O'Neill** and K.A. Woodbury. 2016. Gaussian Process Baseline Regression Models in Industrial Facilities. 2016 ASHRAE Annual Meeting. St. Louis, MO. June 25–29, 2016.
- 32) O'Neill, C.R. and **Z.D. O'Neill**. 2016. Field Investigations of Nanoscale Particle Dispersion and Deposition Emitted from 3D Printers in Ventilated Spaces. *2016 ASHRAE Annual Meeting*. St. Louis, MO. June 25–29, 2016.
- 33) Huang, S., M. Vande Cavey, R. Sterling, W. Zuo, L. Helsen, A. Giretti, M. Bonvini, **Z. D. O'Neill**, M. Wetter, A. Costa, G. Boehme, R. Klein, B. Dong and M. M. Keane. 2016. IEA Annex 60 Activity 2.3: Model use during operation, approach and case studies. CLIMA 2016 - Proc. of the 12th REHVA World Congress, May 22-25, Aalborg, Denmark.
- 34) Li, Y.¹ and **Z.D. O'Neill**. 2016. An EnergyPlus/OpenStudio based Fault Simulator for Buildings. *2016 ASHRAE Winter Meeting*. Orlando, FL. January 24–28, 2016.
- 35) Niu, F.¹ and **Z.D. O'Neill**. 2016. *Bayesian Network Based HVAC Energy Consumption Prediction Using Improved Fourier Series Decomposition*. 2016 ASHRAE Winter Meeting. Orlando, FL. January 24–28, 2016.
- 36) Stering, R., A. Giretti, M. Bonvin, **Z.D. O'Neill**, et al. 2015. IEA Annex 60 Activity 2.3: Model Use During Operation, Approach and Case Studies. *The 14th International Building Performance Simulation Association Conference and Exhibition*. Hyderabad, India. December 7–9, 2015.
- 37) Niu, F.¹, **Z.D. O'Neill**, W. Zuo and Y. Li. 2015. Assessment of Different Data-driven Algorithms for AHU Energy Consumption Predictions. *The 14th International Building Performance Simulation Association Conference and Exhibition*. Hyderabad, India. December 7–9, 2015.
- 38) Li, Y.¹ and **Z.D. O'Neill**. 2015. Evaluating Control Performance of Building HVAC Controllers. *The 14th International Building Performance Simulation Association Conference and Exhibition*. Hyderabad, India. December 7–9, 2015.
- 39) Li, T., G. Shao, S. Huang, W. Zuo and **Z.D. O'Neill**. 2015. Genetic Algorithm for Building Optimization - State-of-the-art Survey. *The 3rd International Conference on Building Energy and Environment (COBEE)*. July 12-15, 2015. Tianjin, China.
- 40) Chen, Y., M. Hu and **Z.D. O'Neill**. 2015. A Collaborative Decision Model for Low Energy Building Design Optimization. ASME 2015 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE 2015). Boston, MA. August 2-5, 2015.
- 41) Qi, T.¹, and **Z.D. O'Neill**. 2014. Inverse Modeling to Estimate the Effective Leakage Area in Buildings. *2014 ASHRAE/IBPSA-USA Building Simulation Conference*. Atlanta, GA. September 10-12, 2014.
- 42) **O'Neill, Z.D.** 2014. Development of a Probabilistic Graphical Energy Performance Model for an Office Building. *2014 ASHRAE Annual Meeting*. Seattle, WA. June 28 –July 1, 2014.
- 43) **O'Neill, Z.D.** and S. Narayanan. 2014. Model Based Estimation of Cold Room Temperatures in Supermarket Refrigeration System. *2014 ASHRAE Winter Meeting*. New York City, NY. January 18–22, 2014.
- 44) Zhang, Y. ¹, **Z.D. O'Neill**, G. Augenbroe and T. Wagner. 2013. Develop an Inverse Model with Uncertainty Quantification to Estimate the Energy Performance of an Office Building. *The 13th International Building Performance Simulation Association Conference and Exhibition*. Chambéry, France. August 25–28, 2013.
- 45) Dong, B., **Z.D. O'Neill**, D. Luo and T. Bailey. 2013. Development and Calibration of a Reduced-order Energy Performance Model for a Mixed-use Building. *The 13th International Building Performance Simulation Association Conference and Exhibition*. Chambéry, France. August 25–28, 2013.
- 46) Li, P., **Z.D. O'Neill** and J. Braun. 2013. Development of Control *Oriented Models for Model Predictive Control in Buildings*. *2013 ASHRAE Annual Meeting*. Denver, CO. June 23–27, 2013.
- 47) Dong, B., **Z.D. O'Neill**, D. Luo, S. Ahuja and T. Bailey. 2012. An Integrated Infrastructure for Real-Time Building Energy Modeling and FDD. *The Fifth National Conference of IBPSA-USA*:

- SimBuild2012*. Madison, Wisconsin. August 1–3, 2012.
- 48) Otto, K., B. Eisenhower, **Z.D. O'Neill**, I. Mezić and S. Narayanan. 2012. Prioritizing Building System Energy Failure Modes Using Whole Building Energy Simulation. *The Fifth National Conference of IBPSA-USA: SimBuild2012*. Madison, Wisconsin. August 1–3, 2012.
 - 49) **O'Neill, Z.D.**, B. Eisenhower, V. Fonoberov and T. Bailey. 2012. Calibration of a Building Energy Model Considering Parametric Uncertainty. *ASHRAE Transactions*, 118(2):189-197. *ASHRAE Annual Meeting*. San Antonio, TX. Jun 23–27, 2012.
 - 50) **O'Neill, Z.D.**, M. Shashanka, X. Pang, T. Bailey and P. Haves. 2011. Real Time Model-based Energy Diagnostics in Buildings. *The 12th International Building Performance Simulation Association Conference and Exhibition*. Sydney, Australia. November 14–17, 2011.
 - 51) Eisenhower, B., **Z.D. O'Neill**, I. Mezić and S. Narayanan. 2011. Impact of Uncertainty on High Performance Building Design. *The 12th International Building Performance Simulation Association Conference and Exhibition*. Sydney, Australia. November 14–17, 2011.
 - 52) Pang, X., P. Bhattacharya, **Z.D. O'Neill**, P. Haves, M. Wetter and T. Bailey. 2011. Real-time Whole Building Performance Monitoring and Fault Detection using EnergyPlus and the Building Controls Virtual Test Bed. *The 12th International Building Performance Simulation Association Conference and Exhibition*. Sydney, Australia. November 14–17, 2011.
 - 53) Li, Z.¹, B. Dong and **Z.D. O'Neill**. 2011. Database Supported BACNet Data Acquisition System for Building Energy Diagnostics. *The 11th International Conference for Enhanced Building Operations*. New York City, NY. October 18–20, 2011.
 - 54) Sun, B.¹, P. Luh and **Z.D. O'Neill**. 2011. Building Energy Doctors: SPC and Kalman Filter-Based Fault Detection and Diagnosis. *The 7th IEEE International Conference on Automation Science and Engineering*. Trieste, Italy. August 24–27, 2011.
 - 55) **O'Neill, Z.D.**, B. Eisenhower, S. Yuan, T. Bailey, S. Narayanan and V. Fonoberov. 2011. Modeling and Calibration of Energy Models for a DoD Building. *ASHRAE Transactions*, 117(2): 358-365. *ASHRAE Annual Meeting*. Montreal, Québec, Canada. June 25–29, 2011.
 - 56) **O'Neill, Z.D.**, S. Narayanan and R. Brahme. 2010. Model-Based Load Estimation for Buildings. *Fourth National Conference of IBPSA-USA: SimBuild2010*. New York City, NY. August 11–13, 2010.
 - 57) Brahme, R., **Z.D. O'Neill**, W. Sisson and K. Otto. 2009. Using Existing Whole Building Energy Tools for Designing Net Zero Energy Buildings – Challenges and Workarounds. *The 11th International Building Performance Simulation Association Conference and Exhibition*. Glasgow, Scotland. July 27–30, 2009.
 - 58) Yuan, S. and **Z.D. O'Neill**. 2008. Testing and Validating an Equation Based Dynamic Building Program with ASHRAE Standard Method of Test. *Third National Conference of IBPSA-USA: SimBuild2008*. Berkeley, CA. July 30–August 1, 2008.
 - 59) **O'Neill, Z.D.** and J. D. Spitler. Modeling of Standing Column Wells in Ground Source Heat Pump Systems. *The 10th International Conference on Thermal Energy Storage*. Richard Stockton College, New Jersey. May 31–June 2, 2006.
 - 60) **Deng, Z.** and J.D. Spitler. Modeling and Parametric Study of Standing Column Well Systems. *First National Conference of IBPSA-USA: SimBuild2004-Building Sustainability and Performance through Simulation*. Boulder, CO. August 4–6, 2004. (Poster only)
 - 61) **Deng, Z.** and J. D. Spitler and S. J. Rees. A Simplified Model for Standing Column Well Systems. *The Conference on the Clean Energy Plan for GYMS Engineering of Beijing 2008 Olympic Games*. Beijing, China. July 6–8 2004.
 - 62) **Deng, Z.** 2004. Modeling and Parametric Study of Standing Column Well Systems. *24th Oklahoma AIAA/ASME Symposium*. Oklahoma City, OK. February 2004.
 - 63) Rees, S. J., **Z. Deng**, A. Chiasson and J. D. Spitler. 2001. Advanced in Modeling Standing Column Wells. *2001 International Ground Source Heat Pump Association Technical Conference*, Stillwater,

OK. May 2001.

- 64) **Deng, Z.**, Y. Zhao and Q. Li. 2001. Thermal Comfort Studies on the Hybrid System, *Displacement Ventilation Symposium 2001 Technical Papers*, Shanghai, China.
- 65) Li, Q. and **Z. Deng**. 1999. The Practical Application of Displacement Ventilation in China, *Shanghai-Hong Kong HVAC Seminar'99 Technical Papers*, Shanghai, China.

Other Major Publications and Research Reports

- 1) O'Neill, Z. D., X. Lu and Z. Zhou, 2020. *ASHRAE RP-1819 CO₂ Demand Controlled Ventilation in Multiple Zone VAV Systems with Multiple Recirculation Paths*. ASHRAE Research Project Final Report.
- 2) Wang, L., Z. Zhou and Z.D. O'Neill, 2018. *ASHRAE RP-1702 Case Studies to Test Performance Measurement Protocols*. ASHRAE Research Project Final Report.
- 3) O'Neill, Z.D., Y. Li, X. Zhou, Y. Li, S. Taylor and H. Cheng, 2017. *ASHRAE RP-1747 Implementation of RP-1547 CO₂-based Demand Controlled Ventilation for Multiple Zone HVAC Systems in Direct Digital Control Systems*, ASHRAE Research Project Final Report.
- 4) O'Neill, Z.D., Y. Li, A. Henry, K. Williams, R. Liu and X. Zhou. 2016. *ASHRAE RP-1587 Control Loop Performance Assessment*. ASHRAE Research Project Final Report.
- 5) Adetola, V., A., S. Ahuja, T. Bailey, B. Dong, T. Khawaja, D. Luo, Z.D. O'Neill and M. Shashanka. 2013. *Scalable Deployment of Advanced Building Energy Management Systems*. DOD ESTCP Final Report EW-1015. <http://www.serdp.org/Program-Areas/Energy-and-Water/Energy/Conservation-and-Efficiency/EW-201015>
- 6) T. Bailey, Z.D. O'Neill, M. Shashanka, X. Pang, P. Bhattacharya and P. Haves. 2011. *Automated Continuous Commissioning of Commercial Buildings*. DOD ESTCP Final Report EW-0929. <http://www.serdp.org/Program-Areas/Energy-and-Water/Energy/Conservation-and-Efficiency/EW-200929>
- 7) Ahuja, S., N. Desai, S. Narayanan, Z.D. O'Neill, S. Peles, A. Surana, R. Taylor, S. Yuan, B. Eisenhower, V. Fonoberov, I. Mezić, K. Otto, E. Cliff, J. Borggaard, J. Burns, A. Lewis, J. Seewald, P. Ehrlich, 2011., *A Systems Approach to High Performance Buildings: A Computational Systems Engineering R&D Program to Increase DoD Energy Efficiency*. DOD ESTCP Final Report SI-1709.
- 8) O'Neill, Z.D., S. Narayanan and R. Brahme. 2009. *Model Based Load Estimation in High Performance Buildings*. DOE Report DE-AC02-05CH11231.
- 9) Lazarevic, A., M. Giering, A. Tewari and Z.D. O'Neill. 2009. *Real Time Decision Support: Data Mining Based Building Diagnostics*. United Technologies Corporation Report 1.952.0904. East Hartford, CT.
- 10) O'Neill, Z.D. and A. Lazarevic. 2008. *Real Time Decision Support: Model Based Estimation and Prediction of Cold Room Temperatures in Supermarket*. United Technologies Corporation Report 1.952.0803-1. East Hartford, CT.
- 11) Lazarevic, A. and Z.D. O'Neill. 2008. *Data Mining Based Classification of Alarm Recommendations for Supermarket*. United Technologies Corporation Report 1.952.0803-2. East Hartford, CT.
- 12) Feng, Y. and Z.D. O'Neill. 2008. *Diagnostics and Prognostics: Analyses of Rack Performance Based on Energy Consumption and Cooling Capacity*. United Technologies Corporation Report 3.400.0815. East Hartford, CT.
- 13) Yuan, S. and Z.D. O'Neill. 2007. *Test Building Models in UTC Dymola Library Ver. 4.0 with ANSI/ASHRAE Standard 140-2004*. United Technologies Corporation Report 1.952.0799-2.2. East Hartford, CT.
- 14) O'Neill, Z.D. and T. Carriere. 2007. *Net Zero Energy Big Box Retail Store Study*. United Technologies Corporation Report 1.770-0004-6. East Hartford, CT.
- 15) Spittler, J. D., S. J. Rees, Z. Deng, A. Chiasson, C. D. Orio and C. Johnson. 2002. *R&D Studies Applied to Standing Column Well Design*, ASHRAE 1119-RP Final Report. American Society of Heating,

Refrigerating and Air-Conditioning Engineers, Inc., Atlanta, GA.

- 16) Deng, Z. 2004. *Modeling of Standing Column Wells in Ground Source Heat Pump Systems*. Ph.D. Dissertation, Oklahoma State University, Stillwater, OK.
- 17) Deng, Z. 2000. *Parametric Study and Performance Analysis of Hybrid Systems Combining Displacement Ventilation with Chilled Ceiling*. Master Thesis, Tongji University, Shanghai.

Selected Invited Presentations and Talks

- 1) An International Network of Networks in Wellbeing for the Built Environment. NSF AccelNet 2020 Meeting Panelist, January 12, 2021
- 2) Towards Smart and Connected Buildings and Cities: Intelligent Building Operations for Efficient, Resilient and Healthy Buildings. J. Mike Walker '66 Department of Mechanical Engineering Graduate Seminar. September 2, 2020
- 3) Smart Ventilation Control May Reduce Infection Risk for COVID-19 in Public Buildings. Texas A&M Engineering COVID Research Response Virtual Panel, July 28, 2020
- 4) Smart Ventilation Control May Reduce Infection Risk for COVID-19 in Public Buildings. *CLEAN 2020 Summit*. August 13, 2020
- 5) Simulation, Testing and Evaluation of Occupancy Sensor Systems. *2020 ASHRAE Virtual Annual Meeting*. July 1, 2020
- 6) Development of Control Quality Factor for HVAC Control Loop Performance Assessment (ASHRAE RP-1587). *2020 ASHRAE Virtual Annual Meeting*. June 29, 2020
- 7) An International Network of Networks in Wellbeing for the Built Environment. NSF AccelNet PI meeting. October 28, 2019. Washington DC.
- 8) Operation Optimization of Grid - Interactive Efficient Buildings for the Grid with High Penetrations of Renewables. *2019 ASHRAE Annual Meeting*. Kansas City, MO. June 23, 2019.
- 9) Building Energy Model Assimilation and Calibration with Real World Sensor Data. *2019 ASHRAE Annual Meeting*. Kansas City, MO. June 23, 2019
- 10) Commercial and Residential Building Occupancy Presence and Counting Sensor Technologies: Goals and Efforts to Date. *2019 ASHRAE Winter Meeting*. Atlanta, GA. January 15, 2019.
- 11) Development of Guidelines/Standards for Occupancy Sensor Testing: ASHRAE's Role. *2019 ASHRAE Winter Meeting*. Atlanta, GA. January 15, 2019.
- 12) Energy Savings from Demand Controlled Ventilation and the Impact of Sensor Error: Simulation Results from RP-1747. *2019 ASHRAE Winter Meeting*. Atlanta, GA. January 12, 2019.
- 13) Quantification of HVAC Energy Savings for Occupancy Sensing in Buildings through an Innovative Testing Methodology. *Smart Building Workshop*, Omaha, NE. November 9, 2018.
- 14) Modelica-Based Dynamic Modeling of a Solar-Powered Ground Source Heat Pump System: A Preliminary Case Study. *American Modelica Conference 2018*. Cambridge, MA. October 9, 2018.
- 15) Intelligent Building Operations for Energy Efficiency: Challenges and Opportunities. College of Engineering, Texas A&M University. College Station, TX. May 24, 2018.
- 16) Quantification of HVAC Energy Savings for Occupancy Sensing in Buildings through an Innovative Testing Methodology. *ARPA-E SENSOR Program PI Meeting*, Boston, MA. May 18, 2018.
- 17) Building Infiltration Estimator with Ultrasonic Thermometry (BLAST). *2017 SERDP and ESTCP Symposium*. Washington DC. November 28, 2017.
- 18) A Collage of the Building Energy Research Group at the University of Alabama. Richland, WA. August 11, 2017.
- 19) The Revolution of Sensor Data in Building Simulation. *The 15th International Building Performance Simulation Association Conference and Exhibition*. San Francisco, August 8, 2017.
- 20) Recurrent Neural Network based Deep Learning Solar Radiation Prediction. *The 15th International Building Performance Simulation Association Conference and Exhibition*. San Francisco, August 8,

2017.

- 21) What's New in Building Energy Model Calibration. *The 15th International Building Performance Simulation Association Conference and Exhibition*. San Francisco, August 8, 2017.
- 22) Operation Optimization of Buildings as Virtual Batteries for the Grid with High Penetrations of Renewables. 2017 ASHRAE Annual Meeting. Long Beach, CA. June 25, 2017.
- 23) Development of A Hardware-in-the-loop Framework with Modelica for Energy Efficient Buildings. 2017 ASHRAE Winter Meeting. Las Vegas, NV. January 29, 2017.
- 24) Real-Time Energy Simulation for Whole Building Performance Monitoring. 2017 ASHRAE Winter Meeting. Las Vegas, NV. January 30, 2017.
- 25) Field Investigations of Nanoscale Particle Dispersion and Deposition Emitted from 3D Printers in Ventilated Spaces. 2016 ASHRAE Annual Meeting. St Louis, MO. June 29, 2016.
- 26) An EnergyPlus/OpenStudio based Fault Simulator for Buildings. 2016 ASHRAE Winter Meeting. Orlando, FL. January 26, 2016.
- 27) Model-Based Real-Time Whole Building Energy Performance Monitoring and Diagnosis, Part 2: Fault Detection and Diagnosis. 2015. 2015 ASHRAE Annual Meeting. Atlanta, GA. June 28, 2015.
- 28) A Modelica-based Dynamic Fault Simulator for Air Handler Units. 2014. *North America Modelica Users' Group Conference 2014*. Atlanta, GA. October 14, 2014.
- 29) Development of a Probabilistic Graphical Energy Performance Model for an Office Building. 2014 ASHRAE Annual Meeting. Seattle, WA. July 1, 2014.
- 30) Model-based Real-time Whole Building Energy Performance Monitoring and Diagnostics. Hong Kong Polytechnic University. Hong Kong. May 7, 2014.
- 31) Model-based Real-time Whole Building Energy Performance Monitoring and Diagnostics. Tongji University. Shanghai, China. May 26, 2014.
- 32) Model Based Estimation of Cold Room Temperatures in Supermarket Refrigeration System. 2014 ASHRAE Winter Meeting. New York City, NY. January 21, 2014.
- 33) Model-based Real-time Whole Building Energy Performance Monitoring and Diagnostics. *IMA Hot Topics Workshop: Mathematical and Computational Challenges in the Control, Optimization, and Design of Energy-Efficient Buildings*. Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. June 12, 2013.
- 34) Building Energy Model Assimilation with Real World Sensor Data. *Energy Modeling: Tools for Designing High Performance Buildings Conference*. Atlanta, GA. October 1, 2012.
- 35) Advanced Building Energy Management Systems Demonstration. *EPA Green Building Research Symposium*. Philadelphia, PA, July 17, 2012.
- 36) Calibration of a Building Energy Model Considering Parametric Uncertainty. *ASHRAE Annual Meeting*. San Antonio, TX. Jun 26, 2012.
- 37) Calibration of Energy Models. AEE meeting. New York, NY. February 27, 2012.
- 38) Modeling and Calibration of Energy Models for a DoD Building. ASHRAE Annual Meeting. Montreal, QC. June 27, 2011.
- 39) O'Neill, Z.D. and X. Chang. 2011. A Modelica-based Dynamic Fault Simulator for Air Handler Units. ASHRAE Annual Meeting. Montreal, QC. Jun 26, 2011.
- 40) Modeling and Calibration of Building Energy Models for a DoD Building. *Energy Modeling: Tools for Designing High Performance Buildings Conference*. Atlanta, GA. April 5, 2011.
- 41) Towards Net Zero Energy High Performance Buildings. College of Engineering, University of Miami. Coral Gables, FL. February 28, 2011.
- 42) Towards Net Zero Energy High Performance Buildings. Department of Mechanical Engineering, The University of Alabama. Tuscaloosa, AL. November 30, 2010.
- 43) Towards Net Zero Energy High Performance Buildings. Erik Jonsson School of Engineering and Computer Science, The University of Texas at Dallas. Dallas, TX. May 18, 2010.

- 44) Towards Net Zero Energy High Performance Buildings. College of Engineering, The University of Oklahoma. Norman, OK. April 20, 2009.
- 45) Remote Monitoring and Ongoing Commissioning for High Performance Buildings. National Renewable Energy Laboratory. Golden, CO. October 27, 2008.
- 46) Net Zero Energy Big-box Retail Store Study. ASHRAE winter meeting. New York City, NY. January 20, 2008.
- 47) Two Strategies for Energy Conservation: Ground Source Heat Pump Systems and Ongoing Commissioning. United Technologies Research Center. East Hartford, CT. July 31, 2006.
- 48) Performance Analysis of Single U-tube and Standing Column Well Ground Heat Exchangers. ASHRAE annual meeting. Quebec City, June 27, 2006.
- 49) A Model for Annual Simulation of Standing Column Well Ground Heat Exchangers. ASHRAE winter meeting. Chicago, IL. January 23, 2006.
- 50) Modeling and Simulation of Ground Heat Exchangers. Advanced Heat transfer LLC. Memphis, TN. July 8, 2004.
- 51) Ground Source Heat Pump and Standing Column Well. College of Architecture, Texas A&M University. College Station, TX. May 7, 2004.

PATENTS AND INNOVATIONS

- 1) **US Patent 9,037,302.** O'Neill, Z. D., S. Narayanan, M. Diebold and A. Banaszuk. *Model Based System and Method for Estimating Parameters and States in Temperature Controlled Spaces.*
- 2) Fan, J., S. Mijanovic, Y. Feng, D. Fu, Z. D. O'Neill and R. Shi. *System And Method for Controlling A Refrigeration System.* **Publication number: 20120022706**
- 3) Shi, R., D. Fu, J. Fan, Y. Feng, Z. D. O'Neill and S. Mijanovic. *Swapped Control for CO2 Supermarket Refrigeration System.* Disclosure Filed.
- 4) Feng, Y., Z. D. O'Neill, R. Shi, D. Fu, J. Fan and S. Mijanovic. *COP Enhancement with Flash Gas IHX for CO2 Supermarket Refrigeration System.* Disclosure Filed.
- 5) Fan, J., Y. Feng, Z. D. O'Neill, S. Mijanovic, D. Fu and R. Shi. *Variable Speed Compressor Control Based on Supply or Return Air Temperatures in Refrigeration HVAC System with Multiple Evaporators.* Disclosure Filed.
- 6) Fan, J., Y. Feng, S. Mijanovic, Z. D. O'Neill, D. Fu and R. Shi. *Adaptive Capacity Control Method for Commercial Refrigeration System with Variable Speed Drive Compressors.* Disclosure Filed.

MEDIA AND PRESS

Building Energy Audit Using Unmanned Aerial Vehicle (March 2016)

- <https://www.phcppros.com/articles/2508-ashrae-funds-24-undergraduate-projects-including-drone-energy-audit>

Building HVAC Controls with Sensors (December 2017)

- <https://www.ua.edu/news/2017/12/improved-sensors-could-reduce-energy-used-for-hvac-systems/>
- <http://www.ejarn.com/news.aspx?ID=48513>
- <https://www.distributioncentermag.com/articles/86031-university-of-alabama-explores-how-improved-sensors-could-reduce-energy-used-for-hvac-systems>
- <http://electronics360.globalspec.com/article/10666/reducing-hvac-energy-use-with-sensors>
- https://www.magnetmail.net/Actions/email_web_version.cfm?publish=newsletter&user_id=ASHRAE&message_id=15022199



- [Fox 6 \(Birmingham\)](http://www.wbrc.com/story/37022052/ua-researchers-studying-motion-sensors-to-cut-back-on-hvac-energy)
<http://www.wbrc.com/story/37022052/ua-researchers-studying-motion-sensors-to-cut-back-on-hvac-energy>

Building Analyzing Energy Conservation Measures in Different Buildings, Climate Zones Using a Large Scale Simulations (January 2018)

- <https://www.ashrae.org/resources--publications/periodicals/enewsletters/ashrae-journal-newsletter/analyzing-energy-conservation-measures-in-different-buildings-climate-zones>

Setting the Standard for Sensor-Driven HVAC Control (April 2018)

- <https://www.achrnews.com/articles/136888-setting-the-standard-for-sensor-driven-hvac-control>

Leading the Way: Women Engineering Professors at UA (October 2018)

- Capstone Engineer Magazine Fall 2018 Issue: <http://news.eng.ua.edu/capstone-engineer/fall-2018/>

UA to Celebrate Research, Creative Activity by UA Faculty (April 2019)

- <https://www.ua.edu/news/2019/04/ua-to-celebrate-research-creative-activity-by-ua-faculty/>

Control Sequence Simulates Multizone HVAC Systems in Direct Digital Control Systems (October 2019)

- The 1st most read ASHRAE research articles that appeared in the 2019 ASHRAE eSociety newsletters
- <https://www.ashrae.org/news/esociety/completed-research-rp-1747>

Developing More Rigorous, Credible Building Performance Measurements (October 2019)

- The 3rd most read ASHRAE research articles that appeared in the 2019 ASHRAE eSociety newsletters
- <https://www.ashrae.org/news/esociety/science-and-technology-for-the-built-environment-feature-august-2019>

Saving the Plant: One Smart Building at A Time

- Capstone Engineer Magazine Fall 2019 Issue: <http://news.eng.ua.edu/capstone-engineer/fall-2019/>

Smart Ventilation Control May Reduce Infection Risk for COVID-19 in Public Buildings (May 2020)

- https://www.eurekalert.org/pub_releases/2020-05/tau-nsf051920.php
- <https://today.tamu.edu/2020/05/15/national-science-foundation-funds-research-into-smart-building-ventilation/>
- https://engineering.tamu.edu/news/2020/05/nsf-funds-texas-am-engineering-research-into-smart-building-ventilation.html?_ga=2.3428400.1692496489.1595711726-353110065.1556494358
- <https://engineering.tamu.edu/mechanical/files/documents/marketing/MEEN-Magazine-2020.pdf>

DOE Securing Grid-interactive Efficient Buildings (GEB) through Cyber Defense and Resilient System (CYDRES) (July 2020)

- <https://today.tamu.edu/2020/07/20/texas-am-leads-project-advancing-cybersecurity-energy-efficiency-in-smart-buildings/>
- <https://www.wevolver.com/article/project-advancing-cybersecurity-energy-efficiency-in-smart-buildings>
- <https://graduatehighlights.tamu.edu/j-mike-walker-66-department-of-mechanical-engineering/>

SERVICE

College Service at TAMU

Faculty Search Committee – Architectural Engineering,

Aug. 2020 – May 2021

Departmental Service at TAMU

Research & Strategic Initiatives Committee,

Aug. 2020 –

Departmental Service at UA

Undergraduate Curriculum Committee,

Sept. 2018 – Dec. 2019

Faculty Search Committee – Thermal-Fluid Science,

Sept. 2018 – May 2019

Faculty Search Committee – Building Energy Systems,

July 2017 – May 2018

Faculty Search Committee – Energy Systems,

Sept. 2013 – May 2014

Faculty Search Committee – Combustion and Energy Systems,

Sept. 2014 – July 2015

Graduate Program Coordinating Committee,

Sept. 2013 – May 2016

Conference Activities (After Jan 2012)

Conference Steering Committee Member

2020 Building Performance Analysis Conference and SimBuild

2020 Health in Buildings Roundtable (HiBR) Conference

Conference Scientific Committee Member

The 12th International Building Performance Simulation Association Conference

The 13th International Building Performance Simulation Association Conference

The 14th International Building Performance Simulation Association Conference

The 15th International Building Performance Simulation Association Conference

The 16th International Building Performance Simulation Association Conference

SimBuild 2012

ASHRAE/IBPSA Building Simulation Conference 2014

American Modelica Conference 2018, Boston, MA

American Modelica Conference 2020, Boulder, CO

The 13th International Modelica Conference (Modelica 2019), Regensburg, Germany

Conference Scholarship Subcommittee Chair

The 13th International Building Performance Simulation Association Conference

SimBuild 2012

ASHRAE/IBPSA Building Simulation Conference 2014

Chair – Conference Sessions

The 12th International Building Performance Simulation Association Conference

The 15th International Building Performance Simulation Association Conference

SimBuild 2012

ASHRAE Annual Meeting, 2014, 2015, 2016, 2017, 2018, 2019, 2020
ASHRAE Winter Meeting, 2014, 2015, 2016, 2017, 2018, 2019, 2020
2020 American Modelica Conference
2020 Building Performance Analysis Conference and SimBuild

Reviewer (After January 2012)

Research Proposals

US Dept. of Energy, SBIR, 2014
US Dept. of Energy, Building Technologies Office (BTO) BENEFITS program, 2016
US Dept. of Energy, Building Technologies Office (BTO) lab call program, 2019
National Science Foundation, CyberSEES, 2015
National Science Foundation, CPS, 2016
National Science Foundation, SAEM, 2018
National Science Foundation, ES CAREER Panel, 2019
National Science Foundation, IIP, 2020
National Science Foundation, EPSCoR, 2020
National Science Foundation, ES, 2020
National Science Foundation, ECI, 2020
The National Institute for Occupational Safety and Health (NIOSH), 2016, 2017
Iowa Energy Center, 2016
Helmholtz Association of German Research Centers, 2018
Dutch Research Council, 2020

Journal Publications

Building Simulation: An International Journal
Energy and Buildings
Building and Environment
Journal of Building Performance Simulation
Journal of Automation in Construction
ASHRAE Transactions
HVAC & R Research, Science & Technology for the Built Environment
IEEE Transactions on Smart Grid
IEEE Transactions on Control Systems Technology
Renewable Energy
Applied Energy
ACM Transactions on Cyber-Physical Systems
Applied Thermal Engineering
Energies
Annals of the New York Academy of Sciences
Energy Conversion and Management
ASME Journal of Engineering for Sustainable Buildings and Cities
ASME Journal of Energy Resources Technology

Conference Publications

ASHRAE Annual and Winter Conferences
ASME Heat Transfer Conference
International Building Simulation Conference' 13, '15, '17, '19
IBSPA-USA SimBuild Conference'08, '10, '12, '14, '16,

Building Performance Analysis Conference and SimBuild '18, '20
2018 American Modelica Conference
The 13th International Modelica Conference (Modelica 2019)
2020 American Modelica Conference