

YOUNGSIK CHOI

J. Mike Walker '66 Department of Mechanical Engineering - 202 Spence St, College Station, TX 77840
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EDUCATION

- PhD** **Texas A&M University**, Mechanical Engineering May 2022 – Present
Advisor: Prof. Zheng O'Neill
Committee: Prof. David Claridge, PhD; Prof. Michael Pate, PhD; Prof. Charles Culp, PhD
- MS** **Seoul National University**, Architecture and Architectural Engineering Mar. 2020 – Feb. 2022
Advisor: Prof. Cheol-Soo Park
Committee: Prof. Myoung-Souk Yeo, PhD; Sun Sook Kim, PhD
Thesis: *'Stochastic Setpoint Temperature Learning for Occupant Behavior-based Control'*
- BS** **Seoul National University**, Architectural Engineering Mar. 2014 – Feb. 2020
Graduated with honors *Cum Laude*
2-year absence to fulfill mandatory military service (Aug. 2016 – Jul. 2018)
- Peking University**, College of Engineering Jul. 2016
Exchange student (Summer session offered in English)

FIELDS OF INTEREST

Building energy modeling and simulation, HVAC optimal control, carbon emission reduction, machine learning.

RESEARCH EXPERIENCE

- PhD Intern**, Pacific Northwest National Laboratory Jul. 2023 – Aug. 2023
- Graduate Research Assistant**, Texas A&M University May 2022 – Present
- Graduate Research Assistant**, Seoul National University Mar. 2020 – Feb. 2022

RESEARCH PROJECTS

- High-performance Whole Building Design 3D-printed Carbon-Absorbing Funicular Structures** Jan. 2023 – Present
DOE ARPA-E HESTIA, @ Texas A&M University
- Developing EnergyPlus model for radiant system for buildings with carbon-absorbing funicular structures.
 - Investigating operational carbon emission reduction calculation.
- Optimizing Supply Air Temperature Control for Dedicated Outdoor Air Systems** May 2022 – Present
ASHRAE 1865, @ Texas A&M University
- Developed EnergyPlus model for DOAS with heat pumps, fan coils, and chilled beams.
 - Developed optimization-informed rule extraction framework for DOAS supply air temperature control.

- Conducting large-scale energy performance analysis on DOAS optimal supply air temperature control.

Construction Weight Analysis

Jul. 2023 – Aug. 2023

Construction Weight Analysis Project @ Pacific Northwest National Laboratory (PNNL)

- Conducted a comprehensive literature review on construction weights and bottom-up building energy modeling.

Development of Building Energy Management System Algorithms

Jun. 2020 – Feb. 2021

Supported by Hyundai Development Company (HDC) I-Controls, @ Seoul National University

- Developed machine learning-based indoor air temperature and electricity prediction models for an existing office building.

Development of Real-time Diagnosis Technology of Home Energy Usage and Smart & Autonomous Control/Management System

Jan. 2020 – Feb. 2022

Supported by Korean Energy Technology Evaluation and Planning (KETEP), @ Seoul National University

- Explored machine learning-based indoor air and setpoint temperature prediction models for existing residential buildings.

HONORS AND AWARDS

Brenda & Jerry Gray '62 Fellowship

Aug. 2024

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

ASHRAE Graduate Grant-In-Aid

May 2024

American Society of Heating, Refrigerating and Air-Conditioning Engineers

Selected and awarded as one of 20 graduate students specializing in ASHRAE-related technologies.

Graduate Student Research and Presentation Travel Award

Aug. 2023

Graduate and Professional Studies, Texas A&M University

Departmental Graduate Student Travel Award

May/Aug. 2023

J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University (2 times)

An AI for IOT Information (AI3) Prize Competition

Feb. 2023

Phase 1 winner, Won \$10,000 as a team (the only student team)

<https://www.us-ignite.org/program/startup-support/nist-iot-competition/>

Emil Buehler Aerodynamic Analog Fellowship

Aug. 2022

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

Outstanding Paper Award (co-author)

Apr. 2022

The 2022 Spring Annual Conference of the Architectural Institute of Korea

Poster Session Award Winner (runner-up)

Dec. 2020

The 2020 Winter Simulation Conference

Organization Scholarship

Sep. 2020 – Feb. 2022

Full tuition (3 semesters), The Education and Research Foundation of Seoul National University

Brain Korea 21 Scholarship

Sep. 2020

Monthly stipend, The National Research Foundation of Korea

Eminence Scholarship Full tuition (4 semesters), Seoul National University	Mar. 2016 – Feb. 2020
Certificate of Appreciation 2018 Key Resolve R.O.K & U.S. Joint Exercise Took charge of interpreting at the R.O.K & U.S. combined task force	May 2018
Organization Scholarship Full tuition, Moon-Ju Scholarship Foundation	Sep. 2015 – Feb. 2016
Merit-based Scholarship Partial tuition (40%), Seoul National University	Mar. 2015 – Aug. 2015

JOURNAL PAPERS

- Choi, Y.,** Lu, X., Feng, F., and O'Neill, Z. (2024). Large-scale optimization and energy performance analysis for dedicated outdoor air system: Simulation results from ASHRAE RP-1865. Accepted to *Science and Technology for the Built Environment* ([In Press](#))
- Choi, Y.,** Lu, X., O'Neill, Z., Feng, F., and Yang, T. (2023). Optimization-informed rule extraction for HVAC system: A case study of dedicated outdoor air system control in a mixed-humid climate zone. *Energy and Buildings*, 113295.

PEER-REVIEWED CONFERENCE PROCEEDINGS

- Choi, Y.** and O'Neill, Z., 2024, Model predictive control of radiant heating system under varying thermal mass scenarios in mixed-humid climate zone, *2024 Texas A&M Conference on Energy*, College Station, TX, USA, Sep 11-13, 2024 (Accepted, presentation only)
- Choi, Y.,** Lu, X., Feng, F., and O'Neill, Z., 2024, Large-scale Energy Performance Analysis for Optimization-informed Rule Extraction for Dedicated Outdoor Air System, *The 1st International Workshop on Building and Simulation (BAS 2024)*, Syracuse, NY, USA, May 13-14, 2024 (Poster only)
- Choi, Y.,** Lu, X., Feng, F., and O'Neill, Z. (2024), Energy Saving Potential Analysis for Primary Schools with Optimal Dedicated Outdoor Air System Control in Different Climate Zones. *2024 ASHRAE Winter Conference*, Jan. 20-24, Chicago, USA.
- Choi, Y.,** Lu, X., O'Neill, Z., and Feng, F. (2023), Optimal Supply Air Temperature Control for Dedicated Outdoor Air System Under Varying Climate Zones. *Building Simulation Conference 2023*, Shanghai, China.
- Choi, Y.,** O'Neill, Z., and Yang, S. (2023), Potentials of Direct Air Capture (DAC) of CO₂ in a Dedicated Outside Air System (DOAS). *ASHRAE Annual Conference 2023*, Jun. 24-28, Tampa, USA.
- Choi, Y.,** Lu, X., O'Neill, Z., and Pang, Z. (2023), Modeling and Simulation of Dedicated Outdoor Air System (DOAS) with a Passive Desiccant Wheel: A Case Study using EnergyPlus. *ASHRAE Annual Conference 2023*, Jun. 24-28, Tampa, USA.

Choi, Y., Shin, H.S., Cho, S., Ko, Y.D., and Park, C.S. (2020), Predictive Uncertainty of Residential Building Energy Model, *2020 Winter Simulation Conference*, Dec. 14-18, Orlando, USA (Virtual Conference). (**Best Poster Award**)

Cho S., Shin. H.S., **Choi, Y.**, Ko, Y.D. and Park, C.S. (2020), Occupant-adaptive indoor environmental controller using DQN, *2020 Winter Simulation Conference*, Dec. 14-18, Orlando, USA (Virtual Conference).

TALKS

O'Neill, Z., Yang, Z., and **Choi, Y.**. A Collage of ASHRAE Research Projects at Building Energy & HVAC Research Group at the Texas A&M University. *Austin ASHRAE 2024 Expo*, Norris Conference Center - Austin, Austin, TX, Apr. 4, 2024.

TEACHING & INSTRUCTIONS

Undergraduate Mentor, Texas A&M University Oct. 2023 – Feb. 2024

- Provided mentorship to an undergraduate team participating in ASHRAE 2024 Design Competition.

Graduate Teaching Assistant, Seoul National University Sep. 2020 – Feb. 2021

- 400.418 Creative Engineering Design: Assisted teaching Creative Engineering Design, an undergraduate course covering the following topics: Integration of architecture and Internet of Things (IoT), Basics of Arduino, and environmental sensors.

Undergraduate Peer Tutor (Work Scholarship), Seoul National University Sep. 2019 – Feb. 2020

- Selected as an undergraduate peer tutor based on academic performance. Taught a junior from the Architecture and Architectural Engineering department about core courses.

Republic of Korea Navy Peer Counselor, R.O.K. Navy Jan. 2018 – Jun. 2018

- Selected as a peer counselor to conduct counseling for soldiers in the military.

Seoul National University Dream Consultants, Seoul National University Jun. 2014 – Aug. 2014

- Organized a mentoring program for high school students in underprivileged areas as a mentor.

TECHNICAL SKILLS

Building Simulation: EnergyPlus, GLHEPro, CC® WinAM, THERM, WINDOW, and Relux

Programming: Python, Visual Basic, Arduino

OTHER EXPERIENCE

Hyundai Engineering and Construction Dec. 2018 – Feb. 2019

- Worksite manager (undergraduate internship)

Republic of Korea Navy Aug. 2016 – Jul. 2018

- Construction engineer & translator (mandatory military service)

Seoul National University Buddy Assistants (SNU Buddy) Mar. 2015 – Dec. 2015

- Organized (as a team leader) and participated in socializing programs for foreign exchange students.

PROFESSIONAL MEMBERSHIP

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

- Student Member (Jan. 2023 – Present)
- Corresponding Member Technical Committee (TC) 7.6 (Building Energy Performance), Provisional Corresponding Member TC 7.5 (Smart Building Systems) (Feb. 2023 – Present)
- Texas A&M Student Chapter Member (Sep. 2023 – Present)

Korean-American Scientists and Engineers Association (KSEA)

- Student Member (Feb. 2024 – Present)

REFERENCES

Available upon request.