

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
GPA: 3.84/4.0

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*’
GPA: 3.97/4.3

BS	Seoul National University , Architectural Engineering Graduated with honors <i>Cum Laude</i> GPA: 3.88/4.3 2-year absence to fulfill mandatory military service (Aug. 2016 – Jul. 2018)	Mar. 2014 – Feb. 2020
	Peking University , College of Engineering Exchange student (Summer session offered in English)	Jul. 2016

FIELDS OF INTEREST

Building energy modeling and simulation, HVAC control, energy performance analysis, 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

Smart Meter Data Analysis
@ Texas A&M University Jun. 2024 – Present

- Exploring smart meter electricity data for 1,931,349 residential buildings in Harris County, Texas.
- Investigating building energy flexibility and resilience.

High-performance Whole Building Design 3D-printed Carbon-Absorbing Funicular Structures Jan. 2023 – Present.
Sponsor: 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.

Optimizing Supply Air Temperature Control for Dedicated Outdoor Air Systems May 2022 – Present

Sponsor: ASHRAE *RP-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.
- Conducted 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

Sponsor: 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

Sponsor: 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

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

- Awarded the 2024 Continuing Student Fellowship based on proven academic and research performance and demonstrated leadership.

ASHRAE Graduate Grant-In-Aid May 2024

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

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

Graduate Student Research and Presentation Travel Award Aug. 2023

Funded by Graduate and Professional Studies, Texas A&M University

Departmental Graduate Student Travel Award May/Aug. 2023

Funded by 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

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

- Awarded the 2022 Departmental Student Fellowship upon acceptance into the graduate program.

Outstanding Paper Award (co-author) <i>The 2022 Spring Annual Conference of the Architectural Institute of Korea</i>	Apr. 2022
Poster Session Award Winner (runner-up) <i>The 2020 Winter Simulation Conference</i>	Dec. 2020
Organization Scholarship Full tuition (3 semesters), Funded by the Education and Research Foundation of Seoul National University	Sep. 2020 – Feb. 2022
Brain Korea 21 Scholarship Monthly stipend, Funded by the National Research Foundation of Korea	Sep. 2020
Eminence Scholarship Full tuition (4 semesters), Funded by Seoul National University	Mar. 2016 – Feb. 2020
Certificate of Appreciation 2018 Key Resolve R.O.K & U.S. Joint Exercise <ul style="list-style-type: none"> • Took charge of interpreting at the R.O.K & U.S. combined task force. 	May 2018
Organization Scholarship Full tuition (1 semester), Funded by Moon-Ju Scholarship Foundation	Sep. 2015 – Feb. 2016
Merit-based Scholarship Partial tuition (40%), Funded by Seoul National University	Mar. 2015 – Aug. 2015

JOURNAL PAPERS

- Guo, M., **Choi, Y.**, Cheong, S.-M., and O'Neill, Z. (2025). Current and Future Residential Electricity Demand Using Large-Scale Smart Meter Data in a Changing Climate. Submitted to *Sustainable Cities and Society*. (**Under review**)
- Choi, Y.**, Lu, X., Feng, F., and O'Neill, Z. (2024). Large-scale energy cost optimization and performance analysis for dedicated outdoor air system: simulation results from ASHRAE RP-1865. *Science and Technology for the Built Environment*, 30(10), 1217-1235.
- 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. (**Presentation only**)
- Choi, Y.**, Lu, X., Feng, F., and O'Neill, Z., 2024, Large-scale Energy Performance Analysis for Optimal Control 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 the *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

Statistical Software: JMP

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), Handbook reviewer for TC 7.5 (Mar. 2025 – Present)
- Texas A&M Student Chapter member (Sep. 2023 – Present)

REFERENCES

Available upon request.