YOUNGSIK CHOI

J. Mike Walker '66 Department of Mechanical Engineering - 202 Spence St, College Station, TX 77840
Cell Phone: (979) 422-6716 – **Email**: youngsik.choi@tamu.edu – **Website**: youngsik-choi.github.io

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 Mar. 2014 – Feb. 2020
Graduated with honors *Cum Laude*
GPA: 3.88/4.3
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

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 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
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 Mar. 2016 – Feb. 2020
Full tuition (4 semesters), Seoul National University

Certificate of Appreciation May 2018
2018 Key Resolve R.O.K & U.S. Joint Exercise
Took charge of interpreting at the R.O.K & U.S. combined task force

Organization Scholarship Sep. 2015 – Feb. 2016
Full tuition, Moon-Ju Scholarship Foundation

Merit-based Scholarship Mar. 2015 – Aug. 2015
Partial tuition (40%), Seoul National University

JOURNAL PAPERS

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*, 1-19.

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 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 CO_2 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

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)
- Texas A&M Student Chapter Member (Sep. 2023 – Present)

REFERENCES

Available upon request.