

YOUNGSIK CHOI

J. Mike Walker '66 Department of Mechanical Engineering - 202 Spence St, College Station, TX 77840
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(Updated on Feb. 15, 2024)

EDUCATION

- PhD** **Texas A&M University**, Mechanical Engineering May. 2022 –
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
Thesis: '*Stochastic Setpoint Temperature Learning for Occupant Behavior-based Control*'
Committee: Prof. Myoung-Souk Yeo, PhD, Sun Sook Kim, PhD
- BS** **Seoul National University**, Architectural Engineering Mar. 2014 – Feb. 2020
Graduated with honors *Cum Laude* (Class rank: 6/66)
2-year absence to fulfill mandatory military service (Aug. 2016 – Jul. 2018)
- Peking University**, College of Engineering Jul. 2016
International Exchange Student (Summer session offered in English)

FIELDS OF INTEREST

Building energy modeling, Building HVAC Control, Machine learning, Building decarbonization

RESEARCH EXPERIENCE

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

RESEARCH PROJECTS

- High-performance Whole Building Design 3D-printed Carbon-Absorbing Funicular Structures** Jan. 2023 –
DOE ARPA-E HESTIA, @ Texas A&M University
- Developing EnergyPlus model for radiant system for buildings with carbon-absorbing funicular structures.
 - Exploring direct carbon capturing potential using HVAC system.
 - Investigating operational carbon emission reduction calculation.
- Optimizing Supply Air Temperature Control for Dedicated Outdoor Air Systems** May. 2022 –
ASHRAE 1865, @ Texas A&M University
- Developing EnergyPlus model for DOAS with heat pumps, fan coils, and chilled beams.

- Developing optimization-informed rule extraction framework for DOAS supply air temperature control.
- Conducting large-scale energy performance analysis on DOAS optimal supply air temperature control.

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

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. 14, 2022

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

Outstanding Paper Award (co-author) Apr. 29, 2022

The 2022 Spring Annual Conference of the Architectural Institute of Korea

Poster Session Award Winner (runner-up) Dec. 14, 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

Eminence Scholarship Mar. 2016 – Feb. 2020

Full tuition (4 semesters), Seoul National University

Certificate of Appreciation May. 3, 2018

2018 Key Resolve R.O.K & U.S. Joint Exercise (Took charge of translation)

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 optimization and energy performance analysis for dedicated outdoor air system: Simulation results from ASHRAE RP-1865. Submitted to *Science and Technology for the Built Environment* (Under review)

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.

CONFERENCE PROCEEDINGS

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**)

Choi, Y., Yi, D.H., Shin, H., Chu, H.G., Yoo, S., and Park, C.S. (2020), Application of transfer learning to a simulation model for room air temperature, *Annual Conference of the Architectural Institute of Korea*, Vol. 40-2, pp. 386-387, Oct. 26-30, Yeosu, Republic of Korea (Virtual Conference).

Choi, Y., Shin, H., Ko, Y., Cho, S., and Park, C.S. (2020), Predictive uncertainty of energy simulation model using Deep Ensembles, *Annual Conference of the Architectural Institute of Korea*, Vol. 40-1, pp. 290-291, Apr. 24, Seoul, Republic of Korea.

TEACHING & INSTRUCTION

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 modeling, Optimization, Machine learning

Programming: Python, Visual Basic, Arduino

OTHER EXPERIENCE

Hyundai Engineering and Construction Dec. 2018 – Feb. 2019

- Worksite manager (undergraduate internship)

Republic of Korea Naval Mobile Construction Squadron May. 2017 – Jul. 2018

- Construction engineer & translator (mandatory military service)

Republic of Korea Naval Academy Oct. 2016 – Apr. 2017

- Building facility manager (mandatory military service)

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

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