# 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 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 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)** 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), Funded by the Education and Research Foundation of Seoul National University

**Brain Korea 21 Scholarship** Sep. 2020
Monthly stipend, Funded by the National Research Foundation of Korea

**Eminence Scholarship** Mar. 2016 – Feb. 2020
Full tuition (4 semesters), Funded by 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 (1 semester), Funded by Moon-Ju Scholarship Foundation

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

## 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 $CO_2$ 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

**Choi, Y.**. "Modeling and Control of Smart HVAC Systems: Insights from Research on Dedicated Outdoor Air Systems" Invited talk at Pukyong National University, Busan, South Korea (Virtual Seminar), Apr. 29, 2025.

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" Invited talk at *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.