YOUNGSIK CHOI

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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
     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* (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 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)*

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 –)

Korean-American Scientists and Engineers Association (KSEA)
- Student Member (Feb. 2024 –)