YOUNGSIK CHOI

youngsik-choi.github.io

(Updated on Oct. 28, 2023)

EDUCATION

PhD **Texas A&M University**, Mechanical Engineering - ***Building Energy & HVAC*** May. 2022 –
Advisor: Prof. Zheng O'Neill

MS **Seoul National University**, Architectural Engineering - ***Building Simulation*** Mar. 2020 – Feb. 2022
Advisor: Prof. Cheol-Soo Park
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*
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 Simulation, EnergyPlus Modeling, Building HVAC Control, Machine Learning, Building Decarbonization

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

Teaching Assistant, Seoul National University Sep. 2020 – Feb. 2021
- 400.418 Creative Engineering Design

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.

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., 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), Large-scale Energy Saving Potential Analysis for Primary Schools with Optimal Dedicated Outdoor Air System Control. 2024 *ASHRAE Winter Conference*, Jan. 20-24, Chicago, USA. (Submitted)

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.

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)