

YOUNGSIK CHOI

youngsik-choi.github.io

(Updated on May. 22, 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

- 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 Travel Award

May. 9, 2023

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

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/challenge-competitions/nist-iot-competition/>

Emil Buehler Aerodynamic Analo Fellowship

Aug. 14, 2022

Fellowship, 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, The Education and Research Foundation of Seoul National University

Eminence Scholarship

Mar. 2016 – Feb. 2020

Full tuition, 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

Y. Choi, X. Lu, Z. O'Neill, F. Feng, T. Yang. (2023), Optimization-informed Rule Extraction for HVAC system: A Case Study of Dedicated Outdoor Air System (DOAS) Control. Submitted to *Energy and Buildings*.

CONFERENCE PROCEEDINGS

Y. Choi, Z. O'Neill, S. Yang (2023), Potentials of Direct Air Capture (DAC) of CO₂ in a Dedicated Outside Air System (DOAS). Extended abstract accepted to *ASHRAE Annual Conference 2023*, Tampa, USA.

Y. Choi, X. Lu, Z. O'Neill, Z. Pang (2023), Modeling and Simulation of Dedicated Outdoor Air System (DOAS) with a Passive Desiccant Wheel: A Case Study using EnergyPlus. Accepted to *ASHRAE Annual Conference 2023*, Tampa, USA.

Y. Choi, X. Lu, Z. O'Neill, F. Feng (2023), Optimal Supply Air Temperature Control for Dedicated Outdoor Air System Under Varying Climate Zones. Accepted to *Building Simulation Conference 2023*, Shanghai, China.

Choi, Y., Shin, H.S., Cho, S., Ko, Y.D. and Park, C.S. (2020), Predictive Uncertainty of Residential Building Energy Model, Proceedings of the 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, Proceeding of 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, Proceeding of 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

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|---|-----------------------|
| Hyundai Engineering and Construction <ul style="list-style-type: none">• Worksite manager (undergraduate internship) | Dec. 2018 – Feb. 2019 |
| Republic of Korea Naval Mobile Construction Squadron <ul style="list-style-type: none">• Construction engineer & translator (mandatory military service) | May. 2017 – Jul. 2018 |
| Republic of Korea Naval Academy <ul style="list-style-type: none">• Building facility manager (mandatory military service) | Oct. 2016 – Apr. 2017 |