

# YOUNGSIK CHOI

[youngsik-choi.github.io](https://youngsik-choi.github.io)

(Updated on May. 22, 2023)

## EDUCATION

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- 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

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Building Simulation, EnergyPlus Modeling, Building HVAC Control, Machine Learning, Building Decarbonization

## EXPERIENCE

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- 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

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- 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.

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**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

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**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*.

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**CONFERENCE PROCEEDINGS**

**Y. Choi**, Z. O'Neill, S. Yang (2023), Potentials of Direct Air Capture (DAC) of CO<sub>2</sub> 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.

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## TECHNICAL SKILLS

**Building Simulation:** EnergyPlus modeling, Optimization, Machine learning

**Programming:** Python, Visual Basic, Arduino

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## OTHER EXPERIENCE

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