

JINYOUNG KO

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EDUCATION

Hanyang University

Seoul, South Korea

M.S. in Architectural Engineering - Architectural Environment System

Sept. 2019 - Aug. 2021

- Thesis: Power generation performance of novel photovoltaic system integrated with thermoelectric generator and phase change material for building application *Best Graduate Thesis Award*
- Advisor: Professor Jae-Weon Jeong; GPA: 4.0/4.0

Hanyang University

Seoul, South Korea

B.S. in Architectural Engineering

Mar. 2014 - Feb. 2017

- *Summa cum laude*, Class rank: 1/44, GPA: 3.75/4.0 *Early graduation in 6 semesters*

RESEARCH EXPERIENCE

Building Mechanical and Environmental Systems Laboratory

Seoul, South Korea

Post-Master Researcher; Advisor: Professor Jae-Weon Jeong

Sept. 2021 - Present

- Developed energy harvesting block to produce electricity from waste heat for building envelop.
 - Modeled 3D-printed energy harvesting block based on Fusion 360.
 - Assessed cyclic generation performance through experiments based on sol-air temperature profile.

Building Mechanical and Environmental Systems Laboratory

Seoul, South Korea

Graduate Research Assistant; Advisor: Professor Jae-Weon Jeong

Sept. 2019 - Aug. 2021

- Established novel concept of building-integrated photovoltaic - thermoelectric generator - phase change material (BIPV-TEG-PCM) system to generate additional electricity from solar thermal energy.
 - Designed energy simulation with a numerical analysis on transient heat transfer through Matlab.
 - Investigated power generation performance and seasonal characteristics of the proposed system.
 - Published journal paper on *Renewable and Sustainable Energy Reviews*.
- Performed building energy simulation on heat-pump driven liquid desiccant HVAC system.
 - Assisted with energy analysis of heat pump-driven liquid desiccant (HPLD) air-conditioning system.
 - Estimated energy saving potential of HPLD-assisted dedicated outdoor air system via energy simulation.
 - Published journal paper on *Applied Thermal Engineering*.
- Presented energy saving approach for outdoor air pre-heating in energy recovery ventilator.
 - Developed variable temperature model for pre-heating via psychrometric equations.
 - Validated proposed model based on design and analysis of computer experiments (DACE).
 - Published journal paper on *Applied Thermal Engineering*.
- Invented innovative HVAC systems based on thermoelectric cooling and heating.
 - Reported an invention of CCHP-assisted dedicated outdoor air system in a *Patent Application*.
 - Reported an invention of cooling tower-integrated thermoelectric cooling system in a *Patent Application*.

Architectural Acoustics Lab (AAL)

Seoul, South Korea

Undergraduate Intern; Advisor: Professor Jin Yong Jeon

Apr. 2016 - Jun. 2016

- Implemented acoustic visualization of floor impact noise in apartments.
 - Conducted in-situ experiments and measurements on floor impact noise according to receiving positions.
 - Preprocessed measured signal data for acoustic visualization via Adobe Audition.

JOURNAL PAPERS

1. **J. Ko**, J.-W. Jeong* (2021). "Annual performance evaluation of thermoelectric generator-assisted building-integrated photovoltaic system with phase change material." *Renewable and Sustainable Energy Reviews*, Vol. 145, 111085. <https://doi.org/10.1016/j.rser.2021.111085>
2. **J. Ko**, J. Park, J.-W. Jeong* (2021). "Energy saving potential of a model-predicted frost prevention method for energy recovery ventilators." *Applied Thermal Engineering*, Vol. 185, 116450. <https://doi.org/10.1016/j.applthermaleng.2020.116450>
3. J.-H. Lee, **J.-Y. Ko**, J.-W. Jeong* (2021). "Design of heat pump-driven liquid desiccant air conditioning systems for residential building." *Applied Thermal Engineering*, Vol. 183, 116207. <https://doi.org/10.1016/j.applthermaleng.2020.116207>

CONFERENCE PROCEEDINGS

International

1. **J. Ko**, S.-Y. Cheon, J.-W. Jeong* (2021). "Phase-change material design for thermoelectric generator assisted building integrated photovoltaic." *2021 ASHRAE annual conference*.
2. **J. Ko**, H. Lim, J.-H. Lee, J.-W. Jeong* (2020). "Development of frost threshold temperature model in energy recovery ventilator regarding indoor and outdoor air conditions." *INDOOR AIR 2020*.

Domestic

1. **J. Ko**, J.-W. Jeong* (2021). "Applicability of a thermoelectric heat-pump for pre-heating in winter operation of an energy exchange ventilator." Spring Conference of the *Korea Institute of Ecological Architectural Environment*.
- 🏆 **Excellent Presentation Award**
2. **J. Ko**, S.-Y. Cheon, Y.-K. Kang, J.-W. Jeong* (2020). "Generation performance of thermoelectric generator and phase change material assisted building integrated photovoltaic module." Fall Conference of *Korean Institute of Architectural Sustainable Environment and Building System*.
- 🏆 **Excellent Presentation Award**
3. **J. Ko**, S.-Y. Cheon, J.-H. Lee, J.-W. Jeong* (2020). "Energy savings of a liquid desiccant-assisted dedicated outdoor air system." Summer Conference of the *Society of Air-Conditioning and Refrigerating Engineers of Korea*.
- 🏆 **Outstanding Conference Paper Award**
4. **J. Ko**, J.-W. Jeong* (2019). "Development of pre-heat temperature prediction model for condensation prevention regarding effectiveness of energy recovery ventilator." Fall Conference of the *Korea Institute of Ecological Architectural Environment*.
- 🏆 **Excellent Presentation Award**

PATENTS

1. J.-W. Jeong, H. Lim, **J. Ko** (2021). "Liquid desiccant-assisted dedicated outdoor air system integrated with thermoelectric modules and CCHP." Application No.10-2021-0081446, South Korea.
2. J.-W. Jeong, S.-Y. Cheon, **J. Ko** (2021). "Apparatus for controlling cooling water temperature of cooling tower: high performance thermoelectric cooling system integrated with cooling tower." Application No.10-2021-0041683, South Korea.

AWARDS AND HONORS

Awards

- Best Graduate Thesis Award, *Hanyang University*, 2021
- Excellent Paper Presentation Award, *Korea Institute of Ecological Architectural Environment Spring Conference*, 2021
- Excellent Paper Presentation Award, *Korean Institute of Architectural Sustainable Environment and Building System Fall Conference*, 2020
- Outstanding Conference Paper Award, *the Society of Air-Conditioning and Refrigerating Engineers of Korea Summer Conference*, 2020
- Excellent Paper Presentation Award, *Korea Institute of Ecological Architectural Environment Fall Conference*, 2019
- Graduation Excellence Award - *Summa cum laude*, *Hanyang University*, 2017
- Excellent Undergraduate Thesis Award, *Hanyang University*, 2016
- Academic Achievement Excellence Awards, *Hanyang University*, 2014, 2015

Scholarship

- National Scholarship for Science and Engineering, *Korean Government*, Mar. 2016 - Feb. 2017
- Merit-based Scholarship, *Hanyang University*, Sept. 2014 - Feb. 2016

SKILLS

Programming Languages	Python, Matlab, HTML
Building / CFD Simulation Tools	TRNSYS, ANSYS Fluent
Engineering Software	Design-Expert, Engineering Equation Solver (EES)
Architecture / Product Design Tools	Autodesk Fusion 360, Rhino, Autodesk AutoCAD, Ultimaker Cura, SketchUp
Documentation Software	L ^A T _E X, Mendeley, Microsoft Office

MILITARY SERVICE

Vision Training Center	Seoul, South Korea
<i>Social Service Agent</i>	<i>Oct. 2017 - Sep. 2019</i>
· Served at a homeless facility as an alternative to the compulsory military service of Korea.	

EXPERIENCE

Rock Band Club - SOKNA, Hanyang University	Seoul, South Korea
<i>President</i>	<i>Jan. 2015 - Dec. 2015</i>
· Managed band club of more than 30 people and held four club performances during a year.	