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*.

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). "Dedicated outdoor air system." 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." 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	LaTeX, Mendeley, Microsoft Office

MILITARY SERVICE

Vision Training Center — Seoul, South Korea
Social Service Agent — *Oct. 2017 - Sep. 2019*

- Served at a homeless facility as an alternative to the compulsory military service of Korea