Curriculum Vitae

Deok-Oh Woo, Ph.D., Assoc. AIA
https://deokoh.wixsite.com/designtechnology

School of Architecture, Planning & Preservation	520 12th Street South
University of Maryland	Arlington, VA 22202
3855 Campus Dr. 145
College Park, MD 20742

EDUCATION

2021	Ph.D. in Architecture, University of Michigan, United States
Thesis Title: *Model Predictive Control-based Surface Condensation Prevention for Thermo-active Building Systems (TABS)*

2014	M.S. in Architectural Engineering, Yonsei University, Republic of Korea
Thesis Title: *Design Optimization through Integrated Design Process*

2012	B.Arch. in Architectural Engineering, Yonsei University, Republic of Korea
Thesis Project Title: *The City Shelf*

PUBLICATIONS

Refereed Journal Articles

2025	*Streamlining Occupant-centric HVAC Operations through Multi-Modal Sensing Capability*, Energy and Buildings
Deok-Oh Woo, Wooyoung Jung, Jonathan Menna, Mazin Al Hamando*

2025	*A Multidisciplinary, Collaborative Approach to Education for Sustainable Development within the Discipline of Architectural Engineering*, Journal of Education for Sustainable Development
Deok-Oh Woo, Ahu Yolac, Julia Kiernan*

2024	*An energy efficiency and cost analysis of utilizing high-intensity profile UVC systems on air handling unit under cool-humid climate*, Building and Environment
Adam Rebecca, **Deok-Oh Woo***, Arpan Guha

2023	*PMV dimension reduction utilizing feature selection method: comparison study on machine learning models*, Energies
Kyungyong Park, **Deok-Oh Woo***

2022	*Impact of hybrid ventilation strategies in energy savings of buildings: in regard to warm and humid climate regions*, Energies
Kyungyong Park, Seung-Bok Leigh, Lars Junghans, **Deok-Oh Woo***

2022	*Collection and Utilization of Indoor Environmental Quality Information Using Affordable Image Sensing Technology*, Energies
Joosang Lee, **Deok-Oh Woo**, Jihun Jang, Lars Junghans, Seung-Bok Leigh

2022	*Parametric Design Study of A Proposed Photobioreactor-integrated Vertical Louver System for Energy-efficient Buildings*, Journal of Green Building
Deok-Oh Woo, Dawon Lee, Suk Lee

2021   *Introduction of a Plug and Play Model Predictive Control to Predict Room Temperatures*, Journal of Building Engineering
            Lars Junghans, **Deok-Oh Woo**

2020   *Framework for Model Predictive Control (MPC)-based Surface Condensation Prevention for Thermo-Active Building Systems (TABS)*, Energy and Buildings
            Deok-Oh Woo, Lars Junghans

Conference Proceedings

2025   *Machine Learning Models for CO_2 Emission Analysis in Campus Buildings*, ARCC 2025, College Park, MD & Washington DC, United States
            Bahereh Vojdani, **Deok-Oh Woo**, Andressa Martinez

2024   *On-Orbit Dynamic Thermal Modeling of Large Deployable Mesh Reflectors*, AIAA SCITECH 2024 Forum, 2040, Orlando, FL, United States
            Na Tan, **Deok-Oh Woo**, Kai Zhou, Christian Kazoleas, Jiajun Zhang, Sichen Yuan

2019   *Surface Condensation Control for Concrete Core Systems utilizing Model Predictive Control*, ASHRAE Winter Conference Atlanta, GA, United States
            Deok-Oh Woo, Lars Junghans

2017   *Predicting Indoor Daylight Illuminance from Solar Irradiance and Weather Forecast Data*, PLEA 2017 Edinburgh, Scotland
            Deok-Oh Woo

2013   *Risk and Economic Analysis of Low Energy Technologies for Apartment Building*, Sustainable Building 13 Oulu, Finland
            Deok-Oh Woo, Jiyoeng Kim, Seung-Bok Leigh, Taeyeon Kim

2012   *A Study on Energy Efficient Envelope Design Guideline through Economic Analysis of Envelope Technology for Low Energy Apartment*, Korea Institute of Ecological Architecture and Environment, Republic of Korea
            Deok-Oh Woo, Jiyoeng Kim, Seung-Bok Leigh, Taeyeon Kim

Books

2025   *Urban Sustainability.,* Springer Nature
            Wrote Chapter 11. Enhancing Building Performance through AI: Techniques, Models, and Practical Challenges

2023   *Natural Energy, Lighting, and Ventilation in Sustainable Buildings,* Springer Nature
            Wrote Chapter 10. Introduction and Literature Review of the Application of Hydronic-based Radiant Cooling Systems in Sustainable Buildings

2022   *101 Rules of Thumb for Sustainable Buildings and Cities*, Hue Heywood
            Technical Editor for Korean Version

2021   *101 Rules of Thumb for Low-Energy Architecture*, Hue Heywood
            Technical Editor for Korean Version

Magazines

2012   *The City Shelf*, Architecture Graduation Works, A&C Publishing (p.152-153)

2011   *The City Shelf*, Magazine Architecture & Culture, NO. 364. A&C Publishing (p.155)

GRANTS AND FELLOWSHIPS

2022	E-Challenge 5, The Engineering Society of Detroit ($172,000)
2022	Faculty Research Fellowship, Lawrence Tech. University ($4,000)
2021	The College of Engineering Seed Grant, Lawrence Tech. University ($5,000)
2020	Rackham Predoctoral Fellowship, Univ. of Michigan ($35,000)
2020	Dow Sustainability Fellowship, Univ. of Michigan ($15,000)
2019	Rackham One-Term Dissertation Fellowship, Univ. of Michigan ($10,890)
2019	The Norman E. and Mary E. Barnett Scholarship, Univ. of Michigan ($11,000)
2019	Rackham Graduate Student Research Grants, Univ. of Michigan ($4,500)
2018-19	Taubman College Summer Funding, Univ. of Michigan ($3,500)
2017	Rackham Supplementary Summer Funding, Univ. of Michigan ($3,500)
2016	Rackham Spring/Summer Research Grants, Univ. of Michigan ($10,000)

AWARDS AND HONORS

2023	Innovative Project Award 2nd Prize, USGBC West Michigan Chapter
2023	Architectural Engineering Institute Student Design Competition (1st Prize Mechanical Systems/1st Prize Building Envelope Optimization)
2021	The Korean Prime Minister's Commendation (PROJECT-project)
2011	Yonsei Bachelor Student Show (2nd Prize), Yonsei University
2011	Korea Student Aid Foundation (Highest Honors)
2010	Yonsei University Scholarship (Honors), Yonsei University
2009	Yonsei University Scholarship (Honors), Yonsei University

RESEARCH EXPERIENCE

University of Maryland

2025-Present	Irradiation Techniques for Disinfecting Air Handling Units to Boost Energy Efficiency: A Pilot Study in Trinity Health Project Investigator, On-site measurement and data analysis Funded by the Citra Tech

Lawrence Technological University

2022-24	An Energy Efficiency Analysis of UV Application in HVAC Systems under Cool-Humid Climate Project Investigator, On-site measurement and data analysis Funded by the Citra Tech
2021-24	Universal Artificial Intelligence (AI)-based occupant comfort control framework for smart buildings Project Investigator, Convolutional neural network (CNN)-based occupancy pattern and HVAC system control algorithm development Funded by the Engineering Society of Detroit (ESD) and DTE Energy

University of Michigan

2020-21	Universal Artificial Intelligence (AI)-based Indoor Environmental Quality (IEQ) Control Framework using Infrared (IR) Array Sensors Research Assistant, Convolutional neural network (CNN)-based occupancy pattern and IEQ learning algorithm development Funded by Dow Sustainability Fellows Program, Graham Sustainability Institute

2019-20	Embedded Biomass into Building Components for Sustainable and Eco-friendly Building System Research Assistant, Research Prototype development and Energy simulation Funded by Kyung Hee University, Republic of Korea
2019-20	Vapor retarder design guideline for timber walls based on site-specific interstitial moisture risk analysis: regarding ASHRAE and high-performance standard buildings Research Assistant, Interstitial moisture risk estimation model development Funded by Rackham Predoctoral Fellowship Program
2016-20	Model Predictive Control-based Surface Condensation Control for Thermo-Active Building Systems (TABS) Research Assistant, Model development and physical experimentation Funded by Taubman College of Architecture and Urban Planning
2016-18	Casa-Sol Energy Simulation Tool Development Research Assistant, Energy simulation tool development and graphical design Funded by Baumschlager Eberle Architekten, Austria
2017-18	Detroit Cultivator: Urban Regeneration in Detroit Research Assistant, Energy simulation and engineering consultation Funded by ArtPlace America
2016-17	Latitudo Borealis: Optimal Building Façade System Development Research Assistant, Energy simulation and physical experimentation The result was presented in 2017 Research through Making program Funded by Taubman College of Architecture and Urban Planning
2016-17	Indoor Illuminance Prediction Tool Development Research Assistant, Model development and physical experimentation The result was published and presented in PLEA 2017 Edinburgh, Scotland Funded by Taubman College of Architecture and Urban Planning

Yonsei University

2012-14	Promoting Green Buildings Based on Market Demand Research Assistant, Integrated design process (IDP) model development Funded by the Ministry of Land, Infrastructure, and Transport of the Korean Government
2012-13	POSCO Green Building Project Research Assistant, Energy simulation and engineering consultation Funded by POSCO E&C
2012-13	Wind Environment Analysis for Wangjing SOHO Beijing Research Assistant, Computation fluid dynamics (CFD) simulationFunded by SOHO China

TEACHING EXPERIENCE

University of Maryland
Architectural Graduate Thesis (Graduate) Fall 2024-Fall 2025
Sustainable Systems (Undergraduate) Spring 2025
Building Optimization (Undergraduate and Graduate) Spring 2025
Environmental Systems (Undergraduate) Fall 2024/2025
Integrated Design Studio (Undergraduate) Fall 2024/2025

Lawrence Technological University
Architectural Engineering Graduate Thesis (Graduate) Fall 2021-Spring 2024
Architectural Engineering Capstone Project (Undergraduate) Fall 2021-Spring 2024
Building Optimization (Graduate) Spring 2022/2023/2024
Advanced Mechanical Systems (Undergraduate) Fall 2021/2022/2023
Fundamentals of Building Physics (Undergraduate) Spring 2022/2023/2024
Building Controls and Instrumentation (Graduate) Fall 2021/2022/2023

University of Michigan
Integrative Systems (Graduate) Fall 2018, Instructor
Environmental Systems (Undergraduate) Winter 2019, Teaching Assistant
Advanced Environmental Systems (Graduate) Winter 2017/2018, Teaching Assistant

PROFESSIONAL EXPERIENCE

Assistant Professor
2024-Present   School of Architecture, Planning & Preservation, University of Maryland
2021-24   Civil + Architectural Engineering, Lawrence Technological University

Pro Bono Design-Build Works
2021-22   SLICE (Sindoasri Learning Institute of Childhood Education)
                 Best School Desing Award in Indonesia
                 School Design and Build Project in Malang, Indonesia
                 Building Environmental Engineer, Building performance simulation and consultation
                 Completed in 2022, Funded by Happy I
2020-22   NOMAD (Nurture our Minds and Dreams)
                 School Design and Build Project in Ulan Bator, Mongolia
                 Building Environmental Engineer, Building performance simulation and consultation
                 Completed in 2022, Funded by Happy I
2019-20   HUG (Home for Unity and Growth)
                 School Design and Build Project in Ta Yaek, Cambodia
                 Building Environmental Engineer, Building performance simulation and consultation
                 Completed in 2020, Funded by Happy I
2019   LOOF, Khelmati English School
                 School Design Project in Tezpur, India
                 Building Environmental Engineer, Building performance simulation and consultation
                 Design proposal, Funded by Happy I

2019   Hi-Lo House

                School Design and Build Project in Phnom Penh, Cambodia
                Building Environmental Engineer, Building performance simulation and consultation
                Completed in 2019, Funded by Happy I

Engineering Firm

2014-15   Susterra Partners Ltd.
                Technical director for energy simulation and engineering consultation

Design Firm

2011   Design Camp Moon and Park Partners, Internship
                Participated in a design competition (Young-Sam Kim presidential library)
                Completed in 2017

PROFESSIONAL SERVICE
Conference Session Chair and Scientific Committee

2025   *ARCC 2025 International Conference,* College Park, MD & Washington DC
2022   *SIMAUD 2022 Symposium on Simulation for Architecture + Urban Design,
                San Diego, CA*

Journal Reviewer

2024   *Microalgae bio-reactive façade: location and weather-based systematic optimization,*
                Building and Environment (Published)

2023   *Development of a multi-node monitoring system for analyzing plant growth and
                indoor environment interactions: an empirical study on a plant factory,* Computers
                and Electronics in Agriculture (Published)

2022   *Influence of triangular-shaped obstacles on the energy and exergy performance of an
                air-cooled photovoltaic-thermal (PVT) collector,* Sustainability (Published)

2022   *Monitoring of thermal comfort and air quality for sustainable energy management
                inside hospitals based on online analytical processing and Internet of thing,*
                International Journal of Environmental Research and Public Health (Published)

Book Proposal Reviewer

2022   *Carbon Positive Architecture, Engineering, and Construction: A Practical Guide for
                Designing Net-Zero Buildings,* Wiley

AFFILIATION & CREDENTIAL

2025-Present   AIA Associate Member, AIA Maryland
2024-Present   ASHRAE Associate Member, National Capital Chapter
2021-24   ASHRAE Member, The advisor for the ASHRAE Lawrence Technological
                University student branch.
2018-21   ASHRAE Student Member, The American Society of Heating, Refrigerating and
                Air-Conditioning Engineers (ASHRAE), Detroit Chapter
2013-17   LEED AP BD+C, The U.S. Green Building Council (USGBC)

VOLUNTEER & LEADERSHIP

2019-24   PROJECT-project
                 Pro bono design-build works
2010   Habitat for Humanity
                 Participated in prefabricated house build project
2007-09   Military Service
                 Served in the Republic of Korea Army (Military engineering)

TECHNICAL SKILLS

Computer Language: Python, C++, C language
Numerical Analysis: MATLAB, R studio
Energy Simulation: EnergyPlus, TRNSYS, Climate Studio, Insight 360, Design Builder, eQuest
CFD Simulation: STAR-CCM+, COMSOL
Airflow Network Simulation: CONTAMW
Solar Analysis: DIVA, Radiance, Climate Studio, Ecotect
Parametric Design: Grasshopper, Octopus, Galapagos
Microcontroller: Raspberry Pi, Arduino
3D Modeling: REVIT, AutoCAD, Rhino, SketchUp, V-ray
Graphics: Illustrator, Photoshop, InDesign
Applications: MS Office