

Curriculum Vitae

Woi Sok [UI SEOK] Oh

422 Hitchcock Hall, 2070 Neil Avenue, Columbus, OH 43210

✉ oh.739@osu.edu | 🏠 <https://www.woisokoh.com/> | ☎ 765-413-7987

PROFESSIONAL APPOINTMENTS

- Aug 2025–* **Assistant Professor**, Department of Systems Design Engineering, University of Waterloo, Canada
- 2024–present* **Postdoctoral Researcher**, Department of Civil, Environmental and Geodetic Engineering, Ohio State University (Advisor: Kelsea Best)
- 2023–2024* **Writing in Science and Engineering Postdoctoral Fellow**, Princeton Writing Program, Princeton University
- 2021–2024* **Postdoctoral Research Associate**, High Meadows Environmental Institute and Department of Ecology & Evolutionary Biology, Princeton University (Advisors: Simon A. Levin and Daniel Rubenstein)

EDUCATION

- 2017–2021* **Ph.D.** Agricultural and Biological Engineering, University of Florida
Dissertation: Navigating Complexity and Multi-dimensionality of the Coupled Natural-Human Systems (Chair: Rachata Muneeppeerakul)
- 2015–2017* **Pursued M.S.** Lyles School of Civil Engineering, Purdue University
Transferred to the University of Florida without an M.S. degree
- 2009–2015* **B.S.** Civil and Environmental Engineering, Yonsei University, South Korea
Military service in 2012–2014

RESEARCH & TEACHING INTERESTS

Complex system modeling of coupled natural-human systems for sustainability, resilience, and equity
Migration network analysis and modeling in linkage with climate extremes and conflict in Somalia
Interactions between climate extremes, conflict, and migration in Africa
Climate resilience and social equity in the United States
Spatial cascading behaviors of climate-related decisions

PUBLICATIONS

In Preparation

Oh W, Sung K, Santos F, Levin SA, & Rubenstein D. Strategic decisions in index insurance and levee maintenance shaping nonlinear resilience in Bangladesh. *Invited to a special session in Global Environmental Change*

Oh W, Best K, Levin SA, Muneeppeerakul R, Rocha J, & Rubenstein D. Beyond context in migration decisions: triadic network structures and their implications in migration modeling.

Oh W & Min Y. Exploring spillover pathways and drivers of rooftop photovoltaic adoption in the US urban and rural systems.

Oh W, Best K, Miao Q, Davlasheridze M, & Reilly AC. Inequal allocations in Community Development Block Grant - Disaster Recovery (CDBG-DR) Funds

Under review

Oh W, Barfuss W, Donges J, Levin SA, & Rubenstein D. Timing dynamics of internal displacement in Somalia vary depending on their coincidence of local political and climatic conditions.
<https://doi.org/10.21203/rs.3.rs-4752717/v1>

Kushwaha N, **Oh W**, Shah S, & Lee E. The triangle of madness: Towards a systematic classification of armed conflicts. <https://doi.org/10.48550/arXiv.2503.00265>

Oh W, Best K, Davlasheridze M, & Peng Y. Lower quality public housing corresponds to elevated flood risk and social disadvantage

Peer-Reviewed Journal Publications

- 2024 **Oh W**, Muneeppeerakul R, Rubenstein D, & Levin SA. Emergent network patterns of internal displacement in Somalia driven by natural disasters and conflicts. *Global Environmental Change*. 84
- 2024 Carmona-Cabrero A, **Oh W**, Muneeppeerakul R, & Muñoz-Carpena R. Decomposing variance decomposition for stochastic models: application to a proof-of-concept human migration agent-based model. *Journal of Artificial Societies and Social Simulation*. 27 (1) 16
- 2023 Thalheimer L, & **Oh W**. Taking stock of displacement data to explain weather and climate-related displacement outcomes. *Climate Risk Management*. 40.
- 2022 **Oh W**, Carmona-Cabrero A, Munoz-Carpena R, & Muneeppeerakul R. On the interplay among multiple factors in an agent-based model: effects of factor configuration in a proof-of-concept migration model. *Journal of Artificial Societies and Social Simulation*. 25 (2) 7
- 2021 **Oh W**, Yu DJ & Muneeppeerakul R. Efficiency-fairness trade-offs in evacuation management of urban floods: The effects of the shelter capacity and zone prioritization. *PLoS ONE*. 16 (6)

- 2020 Yu DJ, Chang H, Davis T, Hillis V, Marston L, **Oh W**, Sivapalan M, Waring. Socio-hydrology: Insights into the Interplay of Engineering Design and Self-organization in a Multi-level World. *Ecology and Society*. 25 (4)
- 2019 **Oh W**, & Muneeppeerakul R. How do substitutability and effort asymmetry change resource management in coupled natural-human systems?. *Palgrave Communications*. 5 (1)

CONFERENCE ACTIVITY/PARTICIPATION

Invited Talks

- 2024 **Oh W**, Min Y, Levin SA, & Best K. Exploring spillover pathways and drivers of rooftop photovoltaic adoption in the US urban and rural systems. *CEREAL Seminar*, High Meadows Environmental Institute, Princeton University.
- 2024 **Oh W**. Coincidence of climate, conflict, and forced migration: a case study in Somali internal displacement. *Migration Working Group*, Toronto Metropolitan University.
- 2022 **Oh W**. How do natural disaster and conflict shape internal displacement?: from network perspectives. *CSH External Faculty Meeting 2022*, Complexity Science Hub Vienna.
- 2022 **Oh W**. Disentangling internal displacement in Somalia: when, where, and how?. *Brown Bag Lunch*, Stockholm Resilience Centre.
- 2021 **Oh W**. How do substitutability and effort asymmetry change resource management in coupled natural-human systems?. *Levin Lab Tea*, Princeton University.
- 2020 **Oh W**, Yu DJ, Muneeppeerakul R. Policy dilemma between efficiency and fairness in urban flood evacuation: incorporating structural and nonstructural features in a conceptual agent-based model. *ADBI-Purdue University-University of Tokyo Virtual Workshop on Resilience of Cities to External Shocks*.

Campus/Departmental Talks

- 2024 **Oh W**. Complex dynamics of human migration: Beyond linear thinking. *Princeton Postdoctoral Council Seminar Series*
- 2022 **Oh W**. Challenges in migration modeling. *Climate Mobilities Working Group*, Princeton University.
- 2022 **Oh W**. Perception and adaptation in human displacement decisions. *Theoretical Ecology Tea Seminar*, Princeton University.
- 2022 **Oh W**. Climate and conflict on internal displacement: network analysis of Somali case. *Colloquium on the Biology of Populations Seminar Series*, Princeton University.
- 2021 **Oh W**. Modeling decision-making processes in human mobility problems: When and where?. *Behavioral Science for Policy Lab Seminar*, Princeton University

Oral Presentations

- 2025 **Oh W**, Best K, Davlasheridze M, & Peng Y. Social disparity, flood exposure, and public housing quality across the United States. *2025 American Association of Geographers Annual Meeting*

- 2024 **Oh W.** Characterizing cascades of rooftop solar adoption in the US urban and rural systems. *DIMACS Workshop on Spreading*, Rutgers University.
- 2024 **Oh W.** Strategic behaviors in index insurance and levee maintenance: tipping behaviors under sea level rise. *International Workshop on Climate-Resilient Development in Southeast Asia*, Harvard University.
- 2024 **Oh W.** Complex dynamics of internal displacement in Somalia driven by climate and conflict. *Horn of Africa Annual Conference Series 2*, York University (virtual).
- 2024 **Oh W.** Tipping Behaviors in Insurance-Levee Interplays Under Climate Change. *AOGS 2024 Annual Meeting*.
- 2024 **Oh W.** Strategic Decisions of Levee Maintenance and Index Insurance in Bangladesh. *CoCCoN Seminar*. Princeton University and Humboldt Universität zu Berlin (virtual).
- 2024 **Oh W.** Higher-order dynamics of human migration: why your migration model is not working. *Climate Mobilities: Justice, Data and Governance Conference*. Princeton University.
- 2023 **Oh W.**, Barfuss W, Donges J, Levin SA, & Rubenstein D. Event coincidence analysis of dryness, conflict, and migration in Somalia: a linkage with migration timing dynamics. *AGU Fall Meeting 2023*.
- 2022 **Oh W.**, Rocha J, & Levin SA. Drivers of internal displacement in Somalia: is it climate adaptation?. *AGU Fall Meeting 2022*.
- 2022 **Oh W.**, Wunderling N, & Levin SA. Heterogeneous triad structures in socio-ecological networks: linkage with system resilience. *AGU Fall Meeting 2022*.
- 2022 **Oh W.**, Muneeppeerakul R, Rubenstein D, & Levin SA. How do natural disasters and conflicts shape internal displacement network in Somalia? *Climate Mobility Research Symposium*, Columbia University.
- 2022 **Oh W.**, Muneeppeerakul R, Rubenstein D, Homayounfar M, & Levin SA. Water and conflict on internal displacement: network analysis of Somali case. *EGU General Assembly 2022*.
- 2017 **Oh W.**, Yu DJ, Davis T, Hillis V, & Waring TM. Towards generalizing co-evolutionary dynamics of socio-hydrology: Theoretical frameworks of cultural evolution and robustness-fragility trade-off. *AGU Fall Meeting 2017*.

Poster Presentations

- 2024 **Oh W.** Triangular thinking for human migration: new implications from triadic migration patterns. *AGU Fall Meeting 2024*.
- 2024 **Oh W.** and Min Y. Exploring spillover pathways and drivers of rooftop photovoltaic adoption in the US urban and rural systems. *AGU Fall Meeting 2024*.
- 2023 **Oh W.** The wicked problem of climate migration: insights from complex systems approaches. *AGU Fall Meeting 2023*.
- 2021 **Oh W.**, Carmona-Cabrero A, Munoz-Carpena R, & Muneeppeerakul R. On the interplay among multiple factors in an agent-based model: Effects of factor configuration in a proof-of-concept migration model. *AGU Fall Meeting 2021*.

- 2021 **Oh W.** Local culture versus hurricane evacuation policies in Galveston, Texas: Are the policies really effective? *AGU Fall Meeting 2021*.
- 2020 **Oh W.**, Carmona-Cabrero A, Munoz-Carpena R, & Muneeppeerakul R (2020). It Matters "How", Not Just What, Factors Are Included: a Case Study of a Migration Agent-Based Model. *AGU Fall Meeting 2020*.
- 2020 **Oh W.**, Muneeppeerakul R, Munoz-Carpena R, & Carmona-Cabrero A. Effects of combining social and hydrological factors in water scarcity-induced migrations: application to a "toy" agent-based model. *University of Florida Water Institute Symposium 2020*.
- 2019 **Oh W.**, Muneeppeerakul R, Munoz-Carpena R, & Carmona-Cabrero A. Exploring effects of factor configurations in a "toy" migration agent-based model. *AGU Fall Meeting 2019*.
- 2018 **Oh W.**, & Muneeppeerakul R. Effects of substitutability and asymmetry on natural resource management with centralized governance structure. *AGU Fall Meeting 2018*.
- 2018 **Oh W.**, & Muneeppeerakul R. On managing multiple natural resources through centralized governance structure. *ASABE Annual International Meeting 2018*.

RESEARCH EXPERIENCE

- 2024–present **Best Lab**, Ohio State University
Postdoctoral Researcher
Applying machine-learning techniques to better understand urban climate resilience related to disaster governance, housing, and migration
- 2021–2024 **Earth Resilience and Sustainability Initiative**, Princeton University
Postdoctoral Research Associate
Used complex systems approaches to understand complex social dynamics of internal displacement, conflict, energy adoption, and index insurance in linkage with environmental and climatic dynamics.
- 2017–2021 **Biocomplexity Lab**, Department of Agricultural and Biological Engineering, University of Florida (partly in ARO-MURI Project in 2019–2021)
Pathfinder Fellow
Developed dynamical and agent-based models to study multi-dimensional interactions in coupled nature-human systems, particularly in natural resource management, flood evacuation, and environmentally induced migration.
- 2017 **Individual Research**, Lyles School of Civil Engineering, Purdue University
Graduate Research Assistant
Applied theories from socio-ecological systems in the case studies of socio-hydrological systems (published a paper in *Ecology and Society*).
- 2016 **NSF Pre-submission Project**, Lyles School of Civil Engineering, Purdue University
Graduate Research Assistant
Researched and reviewed the literature for the NSF pre-submission project named "Sustainable Adequacy Planning in the Residential Building Stock under Deep Uncertainty" led by David J. Yu, Roshanak Nateghi, and Harsha Honnappa.

RESEARCH GRANTS

Understanding and managing Sweden’s exposure to water resilience risks in the Anthropocene
(<https://www.waterresilience.earth/home>)

In-kind Collaborator

Accepted for the call “Securing future water supply through sustainable management 2022” by the Swedish Research Council (FORMAS); total \$ 1.5M for four years (2022–2026)

Predictive models for forced migration and armed conflict

Co-PI

Under review by the Austrian Science Fund (FWF)

TEACHING EXPERIENCE

Ohio State University

Multiple Civil and Environmental Engineering courses (Spring 2024–*present*). Case study designer

Princeton University

Reading and Writing about Scientific Literature (Spring 2023–Fall 2024). Teaching Fellow

University of Florida

Advanced Biosystems Modeling (Spring 2021). Teaching Assistant
Modeling Coupled Natural-Human Systems (Fall 2020). Teaching Assistant
Agent-Based Modeling for Biological Systems (Summer 2020). Course Designer
Stochastic Modeling in Ecology and Hydrology (Fall 2018). Teaching Assistant

Purdue University

Computer Applications in Construction (Spring 2016). Grader

HONORS, FELLOWSHIPS, & GRANTS

2024	Andrew Kim Memorial Foundation Scholarship, Northeastern Regional Conference 2024
2023	KSCEE Young Researcher of the Year Award, Korean-American Society of Civil and Environmental Engineers (KSCEE)
2023	Writing in Science and Engineering Postdoctoral Fellowship, Princeton Writing Program, Princeton University

2021	McNair-Bostick Scholarship, Department of Agricultural and Biological Engineering, University of Florida
2020	Honorarium, <i>ADBI-Purdue University-University of Tokyo Virtual Workshop on Resilience of Cities to External Shocks</i>
2020	Virtual Student Travel Grant, <i>AGU Fall Meeting 2020</i> , AGU
2020	2nd Winner, <i>ABE Poster Symposium</i> , Department of Agricultural and Biological Engineering, University of Florida
2020	KSEA-KUSCO Graduate Scholarship, Korean Scientists and Engineers Association (KSEA) & Korea-U.S. Science Cooperation Center (KUSCO)
2020	KSEA-GFC Scholarship, KSEA Gainesville Chapter
2018	Grinter Fellowship, Department of Agricultural and Biological Engineering, University of Florida
2017–2021	Pathfinder Fellowship, Department of Agricultural and Biological Engineering, University of Florida
2011	Dean’s List, Department of Civil and Environmental Engineering, Yonsei University

KNOWLEDGE TRANSLATION & MOBILIZATION

2020–2021	AI for Good Simulator project Volunteer Modeler Developed a GIS-based agent-based model of COVID-19 diffusion and mitigation establishments in the Moria refugee camp, Greece (Code).
2022–2024	Journal Club in the <i>Proceedings of the National Academy of Sciences</i> Front Matter Panelist Reported recent scientific articles for public communications.

ACTIVITIES

Workshop & Organizational Activities

Selected participant in the Summer Institute in Migration Research Methods held by Berkeley Interdisciplinary Migration Initiative (2022 & 2024)—received travel, accommodation, and meal support.

Workshops and symposiums organized:

“Workshops on Critical Transitions”: Part I and II (2022, virtual). Part III (2023, in person) with the acquisition of \$33,000 from Princeton Institute for International and Regional Studies, School of Public and International Affairs, School of Engineering and Applied Sciences, Center for Behavioral Science and Public Policy, and High Meadows Environmental Institute

“Earth Resilience and Sustainability Initiative Workshop: Building Collaborations” with researchers at Princeton University, Potsdam Institute for Climate Impact Research, and Stockholm Resilience Centre (2022, virtual)

“University of Florida Water Institute Symposium” (2020)

Seminar series organized:

CEREAL (Conversations on the Environment, Responsible Energy, And Life) seminar series,
High Meadows Environmental Institute, Princeton University (2022–2024)

Panelist in the Climate Mobility Workshop at Princeton University (2024)

Reviewing

Review Editor of the Climate Mobility topic in the *Frontiers in Climate* (2022–2024)

Poster Judge, AAAS Annual Meeting 2022 (virtual)

Volunteer Reviewer in the *University of Florida Journal of Undergraduate Research* (2021)

Reviewer for the AGU travel grant applications (2022, 2023)

Reviewer in *Journal of Hydrology* and *Humanities and Social Sciences Communications*.

Outreach and Service Activities

Postdoctoral representative of the *Committee on Climate for All*, Department of Ecology & Evolutionary Biology, Princeton University (2022–2024)

Outreach Director, KSEA New Jersey Chapter (2022–2024)

Outstanding Student Presentation Award Committee, AGU Global Environmental Change Roster of Leadership (2022–2024)

Student Council Member, KSEA-GFC (2018–2021)

Student Council Member, University of Florida Korean Student Association, University of Florida (2018–2020)

Graduate Mentor in the Junior Preview program, College of Engineering, University of Florida (2018)

Mentor of the Mentor-mentee program, Department of Agricultural and Biological Engineering, University of Florida (2018–2019)

Vice President of the Purdue Korean Civil Engineering Student Association, Purdue University (2016–2017)

Student Council Officer, Korean Society of Civil Engineering (2012)

PROFESSIONAL ASSOCIATIONS

American Association of Geographers (AAG), 2024–*present*

American Physical Society (APS), 2023–2024

European Geophysical Union (EGU), 2022–*present*

American Association for the Advancement of Science (AAAS), 2021–*present*

American Geophysical Union (AGU), 2016–*present*

Korean Scientists and Engineers Association (KSEA), 2017–*present*

American Society of Agricultural and Biological Engineering (ASABE), 2017–2018