Curriculum Vitae

Woi Sok [UI SEOK] Oh

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PROFESSIONAL APPOINTMENTS

2021–*present* **Postdoctoral Research Associate,** High Meadows Environmental Institute and Department of Ecology & Evolutionary Biology, Princeton University (Advisors: Simon A. Levin and Daniel Rubenstein)

2023–*present* **Writing in Science and Engineering Postdoctoral Fellow**, Princeton Writing Program, Princeton University

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 Muneepeerakul)

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 systems for sustainability, resilience, and equity
Nexus between climate, conflict, and human migration
Cascading failures in socio-ecological and resilience against failures
Network analysis and modeling of socio-ecological systems

PUBLICATIONS

Under Review

Oh W, Muneepeerakul R, Rubenstein D, & Levin SA. Emergent network patterns of internal displacement in Somalia driven by natural disasters and conflicts. *Global Environmental Change*

Thalheimer L, & **Oh W**. Taking stock of displacement data to explain weather and climate-related displacement outcomes. *Climate Risk Management*.

Carmona-Cabrero A, **Oh W**, Muneepeerakul 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*.

Peer-Reviewed Journal Publications

2022 **Oh W**, Carmona-Cabrero A, Munoz-Carpena R, & Muneepeerakul 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 & Muneepeerakul 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**, & Muneepeerakul R. How do substitutability and effort asymmetry change resource management in coupled natural-human systems?. *Palgrave Communications*. 5 (1)

CONFERENCE ACTIVITY/PARTICIPATION

Invited Talks

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, Muneepeerakul 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

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

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**, Muneepeerakul 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**, Muneepeerakul 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

2021 **Oh W**, Carmona-Cabrero A, Munoz-Carpena R, & Muneepeerakul 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, & Muneepeerakul 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**, Muneepeerakul R, Munoz-Carpena R, & Carmona-Cabrero A. Effects of combing 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**, Muneepeerakul 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**, & Muneepeerakul R. Effects of substitutability and asymmetry on natural resource management with centralized governance structure. *AGU Fall Meeting 2018*.

2018 **Oh W**, & Muneepeerakul R. On managing multiple natural resources through centralized governance structure. *ASABE Annual International Meeting 2018*.

RESEARCH EXPERIENCE

2021–*present* **Earth Resilience and Sustainability Initiative**, Princeton University
Postdoctoral Research Associate

Used geospatial network analysis to compare emergent properties of internal displacement networks driven by natural disasters and conflicts in Somalia.

Developing an exponential random graph model (ERGM) with geospatial analysis to study what climate attributes drive internal displacement in Somalia.

Conducting causal inference to detect causalities in global food prices and understand cascading failures via causal connections.

2020–2021 **AI for Good Simulator project**
Volunteer Modeler

Developed an GIS-based agent-based model of COVID-19 diffusion and mitigation establishments in the Moria refugee camp, Greece (Code).

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

Accepted Grants

"Understanding and managing Sweden's exposure to water resilience risks in the Anthropocene"
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)

Rejected Grants

"Sustainable transformations in multi-scale and multi-layer trade networks"
In-kind Collaborator (personnel of Principal Investigator)

Rejected for the call "Systems of Sustainable Consumption and Production" by the Belmont Forum

TEACHING EXPERIENCE

Princeton University

Reading and Writing about the Scientific Literature (Spring 2023). Teaching Assitant

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

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, *ADBI-Purdue University-University of Tokyo Virtual Workshop on Resilience of Cities to External Shocks*
2020	Virtual Student Travel Grant, *AGU Fall Meeting 2020*, AGU

2020	2nd Winner, *ABE Poster Symposium*, 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

ACTIVITIES

Workshop & Organizational Activities

Selected participant in the Summer Institute in Migration Research Methods held by Berkeley Interdisciplinary Migration Initiative (2022)—received $700 and accommodation/meal support.

Workshops and symposiums organized:

"Workshops on Critical Transitions": Part I and II (2022, virtual). Planning an in-person workshop 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 (March 2023)

"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-*present*)

Reviewing

Review Editor of the Climate Mobility topic in the *Frontiers in Climate* (2022–present)
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)
Reviewer in *Journal of Hydrology* and *Humanities and Social Sciences Communications*.

Outreach and Service Activities

Front Matter Panelist, Journal Club in the Proceedings of the National Academy of Sciences (2022-present)
Postdoctoral representative of the *Committee on Climate for All*, Department of Ecology & Evolutionary Biology, Princeton University (2022-present)
Outreach Director, KSEA New Jersey Chapter (2022–present)
Outstanding Student Presentation Award committee, AGU Global Environmental Change Roster of Leadership (2022–present)
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

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