

# Jun Hak Lee, PhD

Career Instructor

Department of Landscape Architecture, University of Oregon

Address: 232 Pacific Hall, University of Oregon, Eugene, OR, USA 97403-5249

Email: [junhaki@uoregon.edu](mailto:junhaki@uoregon.edu)

## EMPLOYMENT

- 2017 - present Career Instructor, **University of Oregon**
- 2016 - 2017 Faculty Research Associate, **University of Oregon**
- 2013 - 2016 Lecturer, **University of Texas at Arlington**
- 2012 - 2013 Associate Specialist, **University of California, Berkeley**
- 2011 - 2012 Visiting Independent Advisor. Water & Carbon Cycles Group, **NASA Jet Propulsion Laboratory**
- 2010 - 2011 Post-Doctoral Researcher, **University of California, Berkeley**
- 2009 - 2010 Data Analyst, Traffic Safety Center, **University of California, Berkeley**
- 2002 - 2003 Research Assistant, Institute of Natural Environment Preservation, **Korea University**

## EDUCATION

- 2010 Ph.D. Department of Environmental Science, Policy and Management (Ecosystem Science Major), **University of California, Berkeley** (advisor: Prof. Gregory S. Biging)
- 2001 M.S. Forest Management and Environmental Forestry, **Korea University** (advisor: Prof. Wookyun Lee)
- 1999 B.S. Forest Resources and Environmental Science, **Korea University**

## RESEARCH INTERESTS

- Dynamic Urban Flood Modeling: Development of physically-based models leveraging high-performance computing (HPC) to analyze urban flood dynamics.
- Remote Sensing and Ecosystem Modeling: Integration of aerial imagery and LiDAR for urban and forest ecosystem assessments, including eco-physical 3D data extraction and machine learning applications for feature analysis.
- Wildfire Monitoring: Use of high-resolution imagery and LiDAR-derived 3D data for monitoring wildfire fuel and risk assessment.
- Geospatial Analysis for Environmental Justice: Advanced spatial modeling of climate change impacts on urban infrastructure, participatory GIS, environmental monitoring networks, and analyses of extreme weather events (wildfires and urban flooding).

## RESEARCH EXPERIENCE

### **Water & Carbon Cycles Group, NASA Jet Propulsion Laboratory (JPL)**

*Visiting Independent Advisor (working with Dr. Joshua B. Fisher)*

- NASA Earth System Data Records (ESDR) Uncertainty Analysis, Estimating, Validating and Conveying: Measurement Differences Between Land Surface Temperature and Emissivity Products from EOS Sensors

- Compare different land surface temperature-based evapotranspiration models (SEBS, SEVAL, and METRIC)

### **University of California, Berkeley**

*Post-doctoral researcher (working with Prof. Gregory S. Biging of Ecosystem Science and Prof. John D. Radke of Landscape Architecture and Environmental Planning)*

- [Impacts of predicted sea-level rise and extreme storm events on the transportation infrastructure in the San Francisco Bay Region](#) (funded by California Energy Commission)
- Creating Digital Surface Model by using Light Detection and Ranging (LiDAR) and estimating inundation due to the climate change (focused on sea-level rise)

### **Traffic Safety Center, University of California, Berkeley**

*Spatial Data Analyst (working with Prof. David Ragland of Public Health)*

- Mapping the collision locations (statewide) by using the GIS street data and the Statewide Integrated Traffic Records System (SWITRS) in California.
- California Five Percent Report (from 2006 – 2009), an annual report describing not less than 5 percent of its public roadway locations exhibiting the most severe safety needs to the FHWA (funded by California Department of Transportation)
- Data Collection Project / Strategic Highway Safety Plan (funded by California Department of Transportation)

## **TEACHING EXPERIENCE**

### **University of Oregon**

*Career Instructor*

- Environmental Data Visualization (LA 450/550)
- 3D Mapping with LiDAR (LA 459/559)
- Sensing the Environment (LA 459/559)
- Tools for Landscape Performance Analysis (LA 459/559)
- Introduction to Geographic Information Systems for Landscape Architecture (LA415/515)

### **University of Texas at Arlington**

*Lecturer*

- Understanding Geographic Information Systems (GEOL 4330/5320)
- Spatial Data Analysis – project (GEOL 4331/5321)
- Remote Sensing Fundamentals (GEOL 4333/5323)
- Geographic Data Analysis – project (GEOL 4334/5324)
- Oversee the GIS certificate program at the Department of Earth and Environmental Science

### **University of California, Berkeley**

*Graduate Student Instructor*

- Spatial Data Analysis for Natural Resources (ESPM 210) - 2006, 2007
- Natural Resource Sampling (ESPM 102B) - 2004, 2005

## **PUBLICATIONS**

### **Manuscripts in Progress/Under Review**

- Lee, J.-H.**, S. Lee, Kim, B. Choi, H., S., Noh, S., Process-based urban inundation mapping via downscaling of coarse-resolution water height and high-resolution terrain data (Work in Progress)
- Lee, J.-H.**, Jung, S., Ko, Y., Fisher, J. B., Lee, S., Noh, S., Exploring Spatial and Social Inequities in Flood Exposure: A Dynamic Inundation Modeling Approach Across Varied Magnitude, *Nature sustainability* (Work in Progress)
- Lee, J.-H.**, S. Lee, Kim, B. Choi, H., S., Noh, S., Evaluating the effects of spatial resolution on urban pluvial flood modeling, *Hydrological Processes*; Special Issue: "Pluvial Flooding: maturing process understanding from data scarcity into data abundance" (Revised and re-submitted)

### **Peer-reviewed Journal Articles** (\*denote students)

- Elderbrock, E.\* , Ponette-González, A. G., Rindy, J. E., **Lee, J. -H.**, Weathers, K. C., & Ko, Y. 2023. Modeling Black Carbon Removal by City Trees: Implications for Urban Forest Planning. *Urban Forestry & Urban Greening*, 128013.
- Naik, N. S.\* , Elzeyadi, I., Minson, C. T., & **Lee, J. -H.** 2023. Significance of dynamic over static solar screens on thermal perception in perimeter offices under different sky conditions. *Building and Environment*, 234, 110153.
- Ponette-González, A., Chen, D\*., Elderbrock, E.\* , Rindy, J., Barrett, T., Luce, B., **Lee, J.-H.**, Ko, Y., Weathers, K., 2022, Urban edge trees: urban form and meteorology drive elemental carbon deposition to canopies and soils, *Environmental Pollution*, 314 (120197)
- Naik, N.\* , Elzeyadi, I., Minson, C., **Lee, J.-H.** 2021. Thermal pleasure inside solar screened spaces: an experimental study to explore alliesthesia in architecture, *Building Research & Information* 49(7), 795-812
- Noh, S.J., **Lee, J.-H.**, Lee, S. and Seo, D.J., 2019. Retrospective Dynamic Inundation Mapping of Hurricane Harvey Flooding in the Houston Metropolitan Area Using High-Resolution Modeling and High-Performance Computing. *Water*, 11(3), p.597.
- Noh, S., **Lee, J.-H.**, Lee, S., Seo D.J., Kawaike, K. 2018. Hyper-resolution 1D-2D urban flood modelling using LiDAR data and hybrid parallelization. *Environmental Modelling and Software* 103:131-145
- Lee, J.-H.**, Biging, G.S., Gong, P., Fisher J.B. 2016. An Individual Tree-Based Automatic Registration of Aerial Images to Airborne LiDAR Data. *Photogrammetric Engineering and Remote Sensing* 82(9): 699-710.
- Lee, J.-H.**, Ko, Y, McPherson, E. G. 2016. The feasibility of remotely sensed data to estimate urban tree dimensions and biomass, *Urban Forestry and Urban Greening* 16: 208-220.
- Ko, Y., **Lee, J.-H.**, McPherson, E.G., Roman, L.A. 2015. Long-term monitoring of Sacramento Shade program trees: tree survival, growth and energy-saving performance. *Landscape and Urban Planning* 143:183–191.
- Ko, Y., **Lee, J.-H.**, McPherson, E.G., Roman, L.A. 2015. Factors affecting long-term mortality for residential shade trees: Evidence from Sacramento, CA, *Urban Forestry and Urban Greening* 14: 500–507.
- Lee, J.-H.**, Biging, G.S., Radke, J.D., Fisher, J.B. 2013. An improved topographic map from airborne LiDAR: Application in a forested hillside. *International Journal of Remote Sensing*, 334(20): 7293-7311
- Kim, S.R., Lee, W.K., Kwak, D.A., Biging, G.S., Gong P., **Lee, J.-H.**, Cho H.K., 2011. Forest Cover Classification by Optimal Segmentation of High Resolution Satellite Imagery. *Sensors*, 11(2):1943-1958.

Bigham, J.M., Rice, T.M., Pande, S., **Lee, J.-H.**, Park, S.H., Gutierrez, N., Ragland, D.R., 2009. Geocoding police collision report data from California: a comprehensive approach, *International Journal of Health Geographics*, 8:72

Kwak, D.A., Lee, W.K., **Lee, J.-H.**, Biging, G.S., Gong, P., 2007. Detection of individual trees and estimation of tree height using LiDAR data. *Journal of Forest Research*, 12(6):425-434.

### **PROJECT REPORTS**

Winguth, A. **Lee, J.-H.**, Ko, Y. 2014. Climate Change/Extreme Weather Vulnerability and Risk Assessment for Transportation Infrastructure in Dallas and Tarrant Counties, submitted to the North Central Texas Council of Governments (NCTCOG)

Ko, Y, **Lee, J.-H.** and Radke, J.D. 2014. Monitoring and Modeling Tree Growth, Longevity and Performance Phase Two Report, submitted to the US Forest Service Pacific Southwest Research Station.

Radke, J.D., **Lee, J.-H.** and Ko, Y. 2013. Monitoring and Modeling Tree Growth, Longevity and Performance Phase One Report Submitted to the US Forest Service Pacific Southwest Research Station.

Biging, S., Radke J., **Lee, J.-H.**, 2012. Impacts of predicted sea-level rise and extreme storm events on the transportation infrastructure in the San Francisco Bay Region, submitted to the California Energy Commission (CEC), CEC-500-2012-040

### **THESIS**

**Lee, J.-H.**, 2010, Automated approaches for extracting individual tree level forest information using high spatial resolution remotely sensed data. PhD Dissertation. University of California, Berkeley

**Lee, J.-H.**, 2001, A study on classification and spatial distribution of forest types using IKONOS satellite imagery and GIS. Master Thesis. Korea University

### **CONFERENCE PRESENTATIONS**

**Lee, J.-H.**, Jung, S. Lee, S., Noh, S., Urban Flooding and Environmental Justice: Uncovering Inequities in Portland, Oregon, Abstract accepted. *Association of American Geographers (AAG) Annual Meeting*, Honolulu, HI, USA, April 2024

Ponette-González, A., Elderbrock, E., Rindy, J. Chen, D., **Lee, J.-H.**, Weathers, K. Ko, Y., Urban form influences elemental carbon deposition to city trees: implications for future forest planning, Abstract accepted. *Association of American Geographers (AAG) Annual Meeting*, Honolulu, HI, USA, April 2024

Ghasemi, S., **Lee, J.-H.**, Rockcastle, S. F., Taylor, R., Van Den Wymelenberg, K., The Scene Dynamism as an Aspect of Rating Indoor View Quality. IES Annual Conference, Virtual Conference, August 9-13, 2021.

Ward, P., Castro, I., Fiorelli, T., Fretz, M., Ko, Y., **Lee, J.-H.**, Russel, K., Sivla, C. Van Den Wymelenberg, K., Open Home Project: Designing Modular Housing and Landscapes for Resilient Communities; 2020 *American Council for an Energy Efficient Economy* 2020 Summer Study on Energy Efficiency in Buildings, online; August 17-21, 2020

Ardekani, F. H., **Lee, J.-H.**, Noh, S., and Seo, D. J., Automatic Integrated Control of Lawn Irrigation with Rainwater Harvesting for Water Conservation and Stormwater Reduction, *American Meteorological Society (AMS) Annual Meeting*, Austin, TX, January 2018

- Noh, S., **Lee, J.-H.**, Lee, S., Zhang, Y., Seo D.J., Dynamic inundation mapping of Hurricane Harvey flooding in the Houston metro area using hyper-resolution modeling and quantitative image reanalysis, American Geophysical Union 2017 Fall Meeting, New Orleans, LA.
- Lee, J.-H.**, Dhakal, B., Noh, S., Seo, D.-J., Integrated control of landscape irrigation and rainwater harvesting for urban water management. American Geophysical Union 2016 Fall Meeting, San Francisco, CA.
- Lee, S., Noh, S. J., **Lee, J.-H.**, Seo, D.-J., Hyper-resolution urban flood modeling using high-resolution radar precipitation and LiDAR data, American Geophysical Union 2016 Fall Meeting, San Francisco, CA.
- Seo, D.-J., Fang, Z., Yu, X., Gao, J., Kerkez, B., Zink, M., Noh, S. J., **Lee, J.-H.**, iSPUW: integrated sensing and prediction of urban water for sustainable cities, Hydroinformatics 2016, Incheon, South Korea.
- Lee, J.-H.**, Noh, S., Seo, D. J. and Norouzi, A., Integrated Control of Lawn Irrigation and Rainwater Harvesting for Water Conservation and Stormwater Management in Large Urban Areas, *World Environmental & Water Resources Congress*. West Palm Beach, Florida, May 2016
- Lee, J.-H.**, Seo, D. J. and Norouzi, A., Assessment of the impact of optimal irrigation scheduling with rainwater harvesting for water conservation and runoff reduction in large urban areas, *American Meteorological Society (AMS) Annual Meeting*, New Orleans, LA, USA, January 2016
- Lee, J.-H.**, Estimating the relationship between urban 3D morphology and land surface temperature using airborne LiDAR and Landsat-8 Thermal Infrared Sensor data. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, USA, December 2015
- Lee, J.-H.**, Ko, Y., McPherson, E.G., 2015. Estimating single-tree biomass of urban trees using remotely sensed data. *Association of American Geographers (AAG) Annual Meeting*, Chicago, IL, USA, April 2015
- Winguth, A., **Lee, J.-H.** and Ko, Y., Climate change/extreme weather vulnerability and risk assessments for the Dallas-Fort Worth regional transportation infrastructure. *Climate Resilience & Adaptation Symposium*, Arlington, TX, February 2015.
- Ko, Y., **Lee, J.-H.**, McPherson, E.G., and Roman, L.A. Does greening pay off?: Long-term performance of shade trees in Sacramento, CA. Conference paper forthcoming in the *2015 Association of American Geographers (AAG) Annual Meeting*, Chicago, IL, April 2015.
- Norouzi, A., Nasab, A. R., Seo, D.-J, and **Lee, J.-H.** Estimation of stage-discharge relations in urban streams using a fluid-mechanically-based model, *World Environmental & Water Resources Congress*, Austin, TX, USA, May 2015
- Khan A., Richards, K., Parker, G., McRobie, A., Booij, M., Duan, Z., Naz, B, **Lee, J.-H.**, Khan, M., Spatial and altitudinal variation of precipitation and the correction of gridded precipitation datasets for the Upper Indus Basin and the Hindukush-Karakoram-Himalaya, *European Geosciences Union General Assembly*, Vienna, Austria, April. 2015
- Lee, J.-H.**, Fisher, J.B., Biging, G.S., 2010. Detecting forest canopy height changes using a combination of airborne LiDAR and multi-temporal aerial photographs. *ASPRS Annual Conference*, San Diego, CA, USA
- Lee, J.-H.**, Fisher, J.B., Biging, G.S., 2009. Combining aerial photographs and LiDAR data with automated tree top detection and registration. *ASPRS Annual Conference*, Baltimore, MD, USA
- Lee, J.-H.**, Fisher, J.B., Biging, G.S., 2008. Estimating individual tree level leaf area using airborne LiDAR-driven surface model and canopy point clouds, *ASPRS Annual Conference*, Portland, OR, USA
- Bigham, J.M., Rice, T.M., **Lee, J.-H.**, Pande, S., Ragland, D.R., 2008. A methodology for geocoding California collision data, *American Public Health Association Annual Meeting, "Public Health without Borders"*, San Diego, CA, USA

- Lee, J.-H., Fisher, J.B., Biging, G.S., 2006. Individual Tree Detection with Small Footprint Lidar Data Using Morphological Operation, *MAPPS/ASPRS Specialty Conference*, San Antonio, TX, USA
- Lee, J.-H., Gong, P., Biging, G.S., 2006. Seeing one tree to see the entire forest: Combining high spatial resolution LiDAR data with aerial photography to automate individual tree measurements, *ASPRS Annual Conference*, Reno, CA, USA

### **RESEARCH GRANTS**

- NSF (Senior Personnel, \$1,549,219), Dynamics of Integrated Socio-Environmental Systems (DISES: Integrating environmental justice into urban forest assessment and valuation tools (P.I. Dr. Alexandra Ponette) Jan. 2023 – June. 2028
- US DOI & BLM (co-PI, \$499,990) Grow back better: Social and ecological factors shaping wildfire recovery on nonindustrial private forestlands (P.I. Dr. Heidi Huber-Stearns) – Oct. 2022 – Sep. 2025
- UO OVPRI (co-PI, \$48,700) Recycling greywater using volcanic rocks from the Pacific Northwest (P.I. Dr. Thomas Giachetti)
- UO Inaugural Resilience Initiative Interdisciplinary Seed Funding (Core Team Member, \$50,000) “Integrated Social, Environmental and Economic Justice Framework to Build Resilient Communities for Vulnerable Unhoused Populations” <https://environment.uoregon.edu/integrated-social-environmental-and-economic-justice-framework-build-resilient-communities> (PI: Dr. Yekang Ko)
- UO FOUNDATION Trustee Excellence Fund (co-PI, \$30,000) “Landscape for Humanity: Multifunctional landscapes co-designed for vulnerable urban populations” (PI: Dr. Yekang Ko)
- NSF/University of North Texas (co-PI, \$26,664) “Intra-Urban Variability in Black Carbon Deposition: Rates, Pathways, and Determinants” Subaward of the NSF-CAREER grant (PI Dr. Alexandra Ponette)
- NSF CyberSEES sub-project: Senior Personnel of "Integrated Control of Lawn Irrigation and Rainwater Harvesting in Large Urban Areas for Water Conservation and Stormwater Management" (PI: Dr. Dong-Jun Seo at UTA)
- UTA Interdisciplinary Research Program: Co-Principal Investigator of \$ 17,880 project “The Dallas-FortWorth Community Opportunities for Resilience Education: Climate Science Education Model for the Public and K-12” (PI: Dr. Yekang Ko) - August 2015 - July 2016
- NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENT: Co-Principal Investigator of \$43,360 project “Climate Change/Extreme Weather Vulnerability and Risk Assessments for the Dallas-Fort Worth Regional Transportation Infrastructure” (PI: Dr. Arne Winguth) - September 2014 November 2014
- Graduate Student Travel Grants, Department of Environmental Science, Policy and Management, University of California, Berkeley, 2006, 2008
- The W.S. Rosecrans Fellowship, Department of Environmental Science, Policy and Management, University of California, Berkeley, 2007
- The ESPM Department Fellowship, Department of Environmental Science, Policy and Management, University of California, Berkeley, 2003 – 2006

### **PROFESSIONAL SERVICE (REVIEWER)**

Journal of Landscape Architecture, Landscape Journal, Landscape Research, Urban Forestry & Urban Greening, International Journal of Remote Sensing, Remote Sensing of Environment, Photogrammetric Engineering and Remote Sensing, Hydrology, Forestry, Sensor, Remote Sensing



## **STUDENT ADVISING**

### **Student Project Supervision**

<b>Student</b>	<b>Exp. degree</b>	<b>Title</b>
Yeongseo Yu	Ph.D. (Expected in 2025)	“What Kinds of Solar PV Integrated Urban Forms can Contribute to Climate Change Mitigation and Adaptation?” <u>Dissertation committee member</u>
Nasrin Golshany (Arch.)	Ph.D. (2023)	“The Impact of Human-Centric Lighting Parameters on Older Adult’s Cognitive Performance” <u>Dissertation committee member</u>
Niyati Naik (Arch.)	Ph.D.(2021)	“Investigation of the Impacts of External Dynamic Shading Screens (EDSc) on Occupant Thermal Comfort and Thermal Pleasure” <u>Dissertation committee member</u>
Hooman Parhizkar (Arch.)	Ph.D.(2022)	“Study and design of the Green Technology to Improve Occupational Health and Mitigate Climate Change.” <u>Comprehensive Exam Committee</u>
Aaron Woolverton	MLA (2021)	“Algae as Agents” <u>Master Project (co-advisor)</u>
Sohrab Ghasemi (Arch.)	MS (2021)	“An Investigation on View Dynamism” <u>Master thesis committee</u>

### **Independent Study Projects**

<b>Student</b>	<b>Exp. degree</b>	<b>Title</b>
Feni Kurniati	Ph.D.	“Tourism demand and trend in Indonesia and the Southeast Asia using social media and online resources”
Pamane Chaiwat (Arch.)	Ph.D.	“Text Mining”
Aaron Woolverton	MLA	“Digital Responsive Modeling”
Heather Tietz	MLA	“Ecology of Moss”

### **Mentored Students’ Awards**

Aaron Woolverton ““Algae as Agents” 2021 ASLA Student Design Honor Award - Research Category (Co-faculty advisor)

Jessica Gonzalez; Sam Alig; Andrey Ryciewicz, Aaron Woolverton, Yeongseo Yu; Masayo Simon, William Bonner, Kennedy Rauh, and Briana Meier, PhD. “Fostering Resilience: Implementing a Community Nursery at Opportunity Village Eugene” 2022 ASLA Oregon Student Honor Award (Co-faculty advisor)

### **Guest Lecture/Invited Talks**

“Calming Angry Water: Dynamic Flood Modeling for Climate-Resilient Communities”, University of California, Davis, Davis, March 2024

“Dynamic Facades Seminar” (In Prof. Ihab Elzeyadi’s class, I conduct a workshop and assist students in creating a device designed to transform (specifically to open and close) the shades they designed. (2020-present)

“Geospatial intelligence for climate resilience”, Division of Environmental Science & Ecological Engineering, Korea University, Seoul, South Korea, July 2023

“Introduction to GIS for Transportation research & project”, School of Civil, Environmental and Architectural Engineering, Korea University, Seoul, South Korea, April 2023

“Transpecies Design Exhibition Studio” (In Prof. Kyu-Ho Ahn’s studio class, I conducted a workshop about prototyping interactive lighting devices using Arduino and a distance sensor for the exhibition design at Venice Biennale), January 2022

### **WORKSHOP ATTENDED**

Object-based Image Analysis, (June 7-8, 2007) GIIF, University of California, Berkeley, Berkeley, CA, USA

ASPRS LiDAR Processing and Applications for Characterizing Forest Vegetation (May 2, 2006), Reno, NV, USA

### **RELAVANT SKILLS**

Geo-spatial Data Analysis & Remote Sensing: ArcGIS, ERDAS Imagine, PCI Geomatica, eCognition, Berkeley-ImageSeg (Object-oriented segmentation)

Data Analysis, programming, and modeling: R, Python, MATLAB, Visual Basic, ArcGIS Python scripting

Evapotranspiration Model: SEBS, SEVAL, METRIC

Urban flood model: H12 (High performance, physically based flood model)

Transportation model: SUMO (Simulation of Urban MObility)