Yong Je (YJ) Kim, Ph.D.

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WORK EXPERIENCE

Lamar University, USA *Spring 2022-Present*
Assistant Professor
Center for Resiliency / Department of Civil and Environmental Engineering

- Teaching courses at the undergraduate and graduate level and developing new courses in the specialty area.
- Developing a high-quality, sponsored research program.

Texas State University, USA *Fall 2020-Fall 2021*
Lecturer
Ingram School of Engineering

- Taught three to four courses per semester across undergraduate and graduate engineering programs.
- Developed curriculum for Civil Engineering courses such as Infrastructure Materials Laboratory, Soil Mechanics, and Soil Mechanics Laboratory.
- Mentored engineering students for their career and skills development as future engineers.

University of Illinois at Urbana-Champaign, USA *Fall 2010–Spring 2014*
Research Scientist
Supported by National Science Foundation (NSF)
Traffic Operations and Surveillance

- Developed data mining, anomaly detection, and pattern recognition algorithms for traffic surveillance and management on large-scale highway and railroad networks.
- Used nonlinear system dynamics techniques to model traffic oscillations under complex car-following laws

EDUCATION

University of Central Florida, USA *Spring 2016–Fall 2019*
Doctor of Philosophy in Civil Engineering (Geotechnical Engineering)
Dissertation: Probabilistic Spatio-Magnitude Sinkhole Hazard Analysis for East Central Florida (Advisor: Dr. Boo Hyun Nam)

University of Illinois at Urbana-Champaign, USA *Fall 2008–Spring 2010*
Master of Science in Civil Engineering (Transportation Engineering/Construction Management)

University of Illinois at Urbana-Champaign, USA *Spring 2005–Fall 2007*
Bachelor of Science in Civil Engineering

RESEARCH INTERESTS

- Development and design of a mobile, in-situ levee overtopping simulator
  - Contract with the U.S. Army Engineer Research Development Center (ERDC)
  - Use by the Lamar University's Center for Resiliency for the State of Texas
- Application of remote sensing and machine learning in geotechnical and transportation engineering
  - SAR/InSAR, LiDAR, photogrammetry, and drones
  - Geohazard mapping, identification, and risk assessment
  - Transportation systems and infrastructure monitoring
  - GIS application
- Application of statistics & probability in geotechnical and transportation engineering
  - Probabilistic soil properties/Probabilistic site characterization
  - Optimized geomaterial use, reuse and recycling in road embankments and structural layers
  - Sustainability in transportation geotechnics
- Reliability-based geotechnical analysis and design

RESEARCH EXPERIENCE

Karst Geo-Hazard Group *Spring 2020 – Current*
Research Scientist (co PI)
Ground Truth Validation of Municipal Solid Waste Subsidence Based on a Data-driven InSAR Deep Learning Framework

- To determine the feasibility of using InSAR processed with deep learning as a tool for monitoring and accurately post-predicting the subsidence of waste landfills with millimeter accuracy and for estimating both subsidence settlement rate (long-term longitudinal change) and spatial distribution

University of Central Florida *Spring 2016 – Fall 2019*
Graduate Research Assistant (Florida Sinkhole Research Institute)
Florida Department of Transportation (FDOT)
Development of Statistical Models to Predict the Compressibility of Florida's Soils

- Evaluated the performance of existing correlation models of soil compressibility (Cc, Cr, Cv, Cα), and developed the best performing statistical models that predict the compressibility of Florida's soils.

National Research Foundation of Korea (NRF)
Sinkhole Detection and Characterization Using LiDAR-Derived DEM

- Developed a methodology for the probabilistic detection of sinkholes using LiDAR-derived DEM data.
- Focused on (1) detection of unreported sinkholes in rural and/or inaccessible areas, (2) automatic delineation of sinkhole boundaries, and (3) quantification of the geometric characteristics of those identified sinkholes.

National Institute of Agricultural Sciences of Korea (NIAS)
Enhancement of the Natural Hazard Response System in Rural Communities by Benchmarking the U.S.A. Hazard Response Systems

- Investigated the U.S. natural hazard management system for rural communities and explored ways to apply and optimize the system in Korea.
- Developed a sinkhole susceptibility mapping for central Florida using probabilistic/statistical methods.

University of Illinois at Urbana-Champaign *Fall 2010 – Spring 2014*
Graduate Research Assistant
State of California Air Resources Board (CARB)
Economic and Operational Considerations in Transitioning to a Zero or Near-Zero Emission Rail System in California

- Identified and examined the operational changes and the economic challenges and opportunities required to transition to zero or near-zero emission freight rail operations in California.
- Provided an assessment of how different alternative locomotive technologies, and different deployment strategies within the North American fleet of 29,500 locomotives, may impact railway operations, economics, and logistics.

TEACHING EXPERIENCE

Instructor (Adjunct Faculty), University of Central Florida *Spring 2020*

- Applied Numerical Methods for Civil Engineering (CGN 3405, undergraduate level, 70 students)
  - Role: make undergraduate students understand the application-driven numerical solution of common Civil and Environmental Engineering problems using linear algebra, interpolation, differentiation and integration, nonlinear systems, ODEs and IVPs, and linear programming

Graduate Teaching Assistant, University of Central Florida *Spring 2016 – Fall 2019*

- Geotechnical Engineering I (CEG 4011C, undergraduate level, 80 students)
  - Role: 1) provide laboratory lectures, supervise student's lab tests, and grade the lab reports. 2) introduce the fundamentals of geotechnical engineering (Engineering properties and classification of soils. Design considerations for compaction, seepage, consolidation, and settlement analysis)
- Civil Engineering Materials (CGN 3501C, undergraduate level, 80 students)
  - Role: 1) provide laboratory lectures, supervise student's lab tests, and grade the lab reports. 2) make students understand the mechanical behavior and properties of construction materials such as steel, aluminum, aggregates, cement, concrete, and asphalt concrete
- Mechanics of Materials (EGN 3331C, undergraduate level, 100 students)
- Role: 1) provide laboratory and recitation lectures, supervise student's lab tests, and grade the lab reports. 2) provide an overview of the fundamental concepts of stress, strain, strength, deflection of axial force members, shafts in torsion, beams in flexure, combined stress, the stability of columns, and design of simple elements.

Graduate Teaching Assistant, University of Illinois at Urbana-Champaign *Fall 2010*

- Transportation Engineering (CEE 310, undergraduate level, 60 students)
  - Role: 1) assist the head faculty member with classroom instruction materials, exams, and record keeping. 2) responsible for grading assignments, class participation, and exams.

Invited Lecturer, University of Central Florida

- Geotechnical Engineering I (CEG 4011C) *Spring 2017*
- Geotechnical Engineering II (CEG 4012) *Spring 2018*
- Seepage in Soils (CEG 5405) *Fall 2016*
- Pavement Engineering (TTE 5835) *Fall 2016*

TEACHING INTERESTS

Undergraduate Courses

Engineering Graphics, Soil Mechanics, Foundation Engineering, Earth Retaining Systems, Transportation Planning and Infrastructure, Travel Demand Forecasting, Geometric Design of Highways, Infrastructure Materials, Mechanics of Materials, Statics, Dynamics, Numerical Methods in Civil Engineering, Probability and Statistics for Engineers, Geographical Information Systems (GIS) for Civil and Environmental Systems, etc.

Graduate Courses

Probability, Random Variables, & Stochastic Processes for Engineers, Advanced Geotechnical Engineering, Advanced Foundation Engineering, Advanced Geometric Design of Highways, Applications of GIS, Remote Sensing, and Machine Learning in Civil Engineering, etc.

GRANT SUPPORT

Funded Proposals

Role. **Co-PI.** "Case Study of Rapid Response Research Projects in International Context"
Source: Korean Federation of Science and Technology Societies (KOFST). 2020.

Role. **Co-PI.** "Korean Families and COVID-19" Source: National Science Foundation-funded Social Science Extreme Events Research (SSEER) Network and the CONVERGE facility at the Natural Hazards Center at the University of Colorado Boulder (NSF Award #1841338). 2020.

Proposals Under Review

Role. **Co-PI.** "Collaborative Research: Ground-truth characterization of municipal solid waste (MSW) subsidence based on InSAR deep learning framework" Source: National Science Foundation (NSF CMMI - ECI-Engineering for Civil Engineering for Civil Infrastructure Program). 2021.

Role. **Co-PI.** "Track I – Center Catalyst: Cause, Consequence, and Communication of Topographic Change from Landslides" Source: National Science Foundation (NSF 21-618: Centers for Innovation and Community Engagement in Solid Earth Geohazards). 2021.

Proposals in Preparation

Role. **Co-PI**. "Flood Resilience Center (FRC) for Marginalized Communities" Source: National Science Foundation (NSF) Centers of Research Excellence in Science and Technology (CREST), NSF 18-509.

Role. **Co-PI**. "Cumulative Health Impacts at the Intersection of Climate Change, Environmental Justice, and Vulnerable Populations/Lifestages: Community-Based Research for Solutions" Source: Environmental Protection Agency (EPA), Science to Achieve Results (STAR) program. EPA-G2021-STAR-H1.

Role. **Co-PI.** "Climate Change, Natural Disasters, and Community Resilience: A Multidisciplinary Data-Driven Approach" Source: Office of Research and Sponsored Programs at Texas State University. Multidisciplinary Internal Research Grant (MIRG) Program.

HONORS AND AWARDS

Health Scholar Showcase Award *2021*
Translational Health Research Center, Texas State University

Doctoral Research Support Award *2019*
College of Graduate Studies, University of Central Florida

Excellent Student Paper Award *2018 – 2019*
Korean Transportation Association in America (KOTAA) Annual Meeting

Graduate International Student Scholarship *2018*
Student Government Association, University of Central Florida

Berry Beck Scholarship *2018*
15th Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst and the 3rd Appalachian Karst Symposium

Graduate Travel Grant Award *2017 – 2018*
Graduate Presentation Fellowship, University of Central Florida

UKC 2017 Best Poster Award *2017*
Korean-American Scientist and Engineers Association (KSEA)

PUBLICATIONS

Peer-Reviewed Journal Publications

Published

1. Nur, A.S., **Kim, Y.J.**, and Lee, C.-W. (2022). “Creation of Wildfire Susceptibility Maps in Plumas National Forest Using InSAR Coherence, Deep Learning, and Metaheuristic Optimization Approaches.” *Remote Sensing*. 14, 4416.
2. **Kim, Y. J.**, Nam, B. H., Jung, Y.-H., Liu, X., Choi, S, Kim, D., and Kim, S. (2022). "Probabilistic Spatial Susceptibility Modeling of Carbonate Karst Sinkhole." *Engineering Geology*, 305, 106728.
3. **Kim, Y. J.**, Choi, S., and Nam, B. H. (2021). "Developing Advanced Data-Driven Models to Understand the Complex Patterns of Mask Wearing amid the COVID-19 Pandemic: Efforts to Accelerate Collective Cognition of Shared Risk." *Natural Hazards Review*, 22(2), 02521001.
4. **Kim, Y. J.**, Nam, B. H., Shamet, R., Soliman, M., and Youn, H. (2020). "Development of Sinkhole Susceptibility Map of East Central Florida." *Natural Hazards Review*, 21(4), 04020035.
5. Nam, B. H., **Kim, Y. J.***, and Youn, H. (2020). "Identification and quantitative analysis of sinkhole contributing factors in Florida's Karst." *Engineering Geology*, 271, 105610.
6. Choi, S., Hong, J. Y., **Kim, Y. J.***, and Park, H. (2020). "Predicting Psychological Distress Amid the COVID-19 Pandemic by Machine Learning: Discrimination and Coping Mechanisms of Korean Immigrants in the U.S." *International Journal of Environmental Research and Public Health*, 17(17), 6057.
7. **Kim, Y. J.**, Nam, B. H., and Youn, H. (2019). "Sinkhole Detection and Characterization Using LiDAR-Derived DEM with Logistic Regression." *Remote Sensing*, 11(13), 1592.
8. Soliman, M. H., Shamet, R., **Kim, Y. J.**, Youn, H., and Nam, B. H. (2019). "Numerical investigation on the mechanical behavior of karst sinkholes." *Environmental Geotechnics*, 0(0), 1-15.
9. Park, J., **Kim, Y. J.**, Kim, M., and Lee, W. H. (2019). "A novel method for cell counting of Microcystis colonies in water resources using a digital imaging flow cytometer and microscope." *Environmental Engineering Research*, 24(3), 397-403.
10. Nam, B., Stokoe II, K., Cho, B., **Kim, Y. J.**, and Youn, H. (2019). "A Potential Technology for Road Sinkhole Assessment: The Rolling Dynamic Deflectometer." *Journal of Testing and Evaluation*, 47(3), 1658-1676.
11. Xiao, H., **Kim, Y. J.**, Nam, B. H., and Wang, D. (2016). "Investigation of the impacts of local-scale hydrogeologic conditions on sinkhole occurrence in East-Central Florida, USA." *Environmental Earth Sciences*, 75(18), 1274.

Submitted: Under Review

- Fadhillah, M. F., Jung, Y.-H., Ramayanti, S., Lee, S.-K., Ko, B., Nam, B. H., **Kim, Y. J.**, and Lee, C.-W. “Assessment of Surface Deformation Using Improved Combined Scatterers Interferometry with Optimized Point Scatterers (ICOPS) in Dangjin, South Korea.” *Engineering Geology* (under 1st review).

- **Kim, Y. J.**, Choi, S., and Hong, J.Y. "Perceived Vulnerability to Disease, Resilience, and Mental Health Outcome of Korean Immigrants Amid the COVID-19 Pandemic." *Natural Hazards Review*. (under 3rd review).
- Choi, S., Weng, S., Feliciano, G., Hwang, S., and **Kim, Y. J.** "Environmental Justice and Vulnerable Populations: Perspectives from Environmental Activists." *Societies*. (under 1st review)

In Preparation Based on Completed and Ongoing Research

- **Kim, Y. J.**, Nam, B. H., and Youn, H. "An Effective Method of Predicting Location and Size of Sinkhole in Florida's Karst." *Geophysical Research Letters*. (to be submitted)
- **Kim, Y. J.**, and Nam, B. H. "Application of Multitemporal SAR Interferometry Data to Ground Subsidence Monitoring in East Central Florida." *Engineering Geology*. (to be submitted)
- Copeland, T, **Kim, Y. J.**, and Nam, B. H. "Use of Piezometer Long-Term Monitoring Data for Sinkhole Assessment." *Engineering Geology*. (to be submitted)
- Soliman, M, **Kim, Y. J.**, Nam, B. H., and Arboleda-Monsalve, L. G. "Sinkhole Stability Chart of Central Florida using Numerical Analysis." *Journal of Geotechnical and Geoenvironmental Engineering - ASCE*. (to be submitted)
- **Kim, Y. J.**, Choi, S., and Nam, B. H. "Comparative Study of Artificial Neural Network, Support Vector Machine, and Random Forest Algorithms on Predicting Resilience Amid COVID-19 Pandemic." *Natural Hazards Review – ASCE.* (to be submitted)
- **Kim, Y.J.,** Copeland, T., & Shamet, R. "A Systematic Review of Cumulative Impacts of Winter Storms' Infrastructure Disruptions." *International Journal of Risk Reduction.* (to be submitted)

Book Chapters

1. Nam, B. H., Choi, S., Copeland, T., and **Kim, Y.** "Social vulnerability and Geohazards: Review and Implications," In Sebastiano, D., and Francesco, D.P. (Eds.), Springer. Geohazards and Disaster Risk Reduction: Multidisciplinary and Integrated Approaches. (under review)

Thesis/Dissertation

- Ph.D. Dissertation (2019). "Probabilistic Spatio-Magnitude Sinkhole Hazard Analysis for East Central Florida." University of Central Florida, Orlando, Florida

Conference Proceedings and Presentations

1. **Kim, Y.**, Nam, B. H., Park, K.-W., Shamet, R., and Horhota, D. "Estimation of Soil's Compression and Recompression Index Using Soil Index Properties – Florida Case Study," *Geo-Congress 2022*, March 20-23, 2022, Charlotte, NC. (planned)
2. **Kim, Y.**, and Nam, B. H. "A Preliminary Study on the Use of Differential Interferometric Synthetic Aperture Radar (DInSAR) for Ground Subsidence Assessment," *Geo-Extreme 2021*, November 7-10, 2021, Savannah, GA.
3. Copeland, T., Nam, B. H., **Kim, Y.**, Shamet, R., and Han, H. "Use of X-bar and R Control Chart Methods on Long-term Piezometer Data for Sinkhole Assessment," *Geo-Extreme 2021*, November 7-10, 2021, Savannah, GA.

4. **Kim, Y.**, Nam, B. H., and Youn, H. "Development of a Probabilistic Spatio-Magnitude Sinkhole Hazard Model," *Geo-Congress 2019*, March 24-27, 2019, Philadelphia, PA.
5. **Kim, Y.**, Nam, B. H., and Youn, H. "Development of Probabilistic Spatio-Magnitude Sinkhole Hazard Analysis for East Central Florida," *Transportation Research Board 98th Annual Meeting*, January 13-17, 2019, Washington, D.C.
6. **Kim, Y.**, and Nam, B. H. (2018). "A Comparative Study of Karst Sinkhole Hazard Mapping Using Frequency Ratio and Artificial Neural Network for East Central Florida," *15th Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst*, April 2-6, 2018, Shepherdstown, WV.
7. **Kim, Y.**, Nam, B. H., Lim, C., Jung, H.-S., and Moon, J.-S. (2018). "A Decision Tree Based Hazard Assessment of Karst Sinkholes," *IFCEE 2018*, March 5-10, 2018, Orlando, FL.
8. Rajabi, A., **Kim, Y.**, Kim, S.-H., Kim, Y., Kim, B., and Nam, B. H. (2018). "A Preliminary Study on Use of LiDAR Data to Characterize Sinkholes in Central Florida," *IFCEE 2018*, March 5-10, 2018, Orlando, FL.
9. **Kim, Y.**, Nam, B. H., Lim, C.-S., Xiao, H., and Wang, D. "A Methodology for Sinkhole Geohazard Modeling and Mapping of East Central Florida," *Transportation Research Board 97th Annual Meeting*, January 7-11, 2018, Washington, D.C.
10. **Kim, Y. J.**, and Nam, B. H. (2017). "Sinkhole Hazard Mapping Using Frequency Ratio and Logistic Regression Models for Central Florida," *Geo-Risk 2017*, June 4-7, 2017, Denver, CO.
11. Yeo, J., Kapucu, N., Nam, B., Haupt, B., and **Kim, Y.** (2017). "Aligning protocols with practice: Florida hurricane response network in Matthew 2016," *SPA Public Administration Research Conference*, April 7, 2017, Orlando, FL.
12. **Kim, Y. J.** (2017). "Probabilistic Sinkhole Hazard Model of East Central Florida," *41st SIAM Southeastern Atlantic Section Conference (SIAM-SEAS)*, March 18-19, 2017, Tallahassee, FL.
13. **Kim, Y. J.**, Xiao, H., Wang, D., Choi, Y. W., and Nam, B. H. (2017). "Development of Sinkhole Hazard Mapping for Central Florida," *Geotechnical Frontiers 2017*, March 12-15, 2017, Orlando, FL.

Services

Member, Doctoral Dissertation Committee *June.2022- Current*
Student Name: Jesus Galindo
Member, Center for Resiliency, Education (Engr with Nature Certificate) Committee *Fall 2022- Current*
Member, Master's Thesis Committee *Nov.2021- Current*
Student Name: Emon Roy
Ingram School of Engineering, Texas State University
Invited Guest Editor, *Societies* *Oct.2021-Jul.2022*
Special Issue: Cascading Impacts of Disasters, Environmental Justice, and Community's Resilience
Ad-Hoc Reviewer, Remote Sensing *June 2021*
Ad-Hoc Reviewer, Environmental Engineering Research *September 2021*

MEMBERSHIP AND OTHER ACTIVITIES

Membership

Member, American Society of Civil Engineers (ASCE) *2008-present*
Member, Korean-American Scientists and Engineers Association (KSEA) *2008-present*
Member, Geo-Institute (G-I) of ASCE *2016-present*
Member, Korean Transportation Association in America (KOTAA) *2017-present*
Member, Korean Geotechnical Society (KGS) *2022-present*
Member, Korean Geotechnical Society – North America (KGS-NA) *2022-present*
Member, National Cave and Karst Research Institute (NCKRI) *2018-present*
Member, American Society for Engineering Education (ASEE) *2019-present*

Certificate

Certificate, Professional Engineer (anticipated date to take the exam) *late 2022*
Certificate, Engineer-in-Training (EIT) certification, United States *2019*

Other Activities

Faculty Advisor, American Society of Civil Engineers (ASCE), Lamar University *2022-present*
Technical Committee Member, Geotechnical Engineering Institute at UCF *2022-present*

- Geo-Institute (G-I), Engineering Geology and Site Characterization (EG&SC)

President & Founder, Geotechnical Engineering Institute at UCF *Spring 2018-Summer 2019*

- Established, designed, and promoted the creation of the Geotechnical Engineering Institute Student Organization at UCF
- Facilitated student meetings and provided program support to organization-sponsored events

Mentor, American Society of Civil Engineers (ASCE), University of Central Florida Chapter *2017-2019*
Member, Korean Student Association, University of Central Florida *2016-present*
Military Service (REPUBLIC of KOREA Army), Korea *2000-2002*

COMPUTING and TECHNICAL SKILLS

- Programming languages: MATLAB, C/C++, Python, Mathematica
- Statistical analysis program: R, Minitab
- Geotechnical analysis program: GeoStudio
- GIS program: ArcView, ArcGIS, QGIS, SAGA GIS
- Computer-aided design/engineering program: AutoCAD (including Civil 3D), Revit, SolidWorks
- Pavement analysis program: KENPAVE