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Education

- Ph.D. Geotechnical Engineering, Kansas State University, 2001.
Dissertation: Modeling Fine Particle Clogging in Filters and Drainage Layers.”
Major Advisor: Prof. L.N. Reddi.
- M.S. Computer Science, Kansas State University, 2001.
Project: Session Initiation Protocol.” Major Advisor: Prof. G. Singh.
- M.S. Geotechnical Engineering, Zhejiang University, P.R. China, 1997.
Thesis: “Reliability Study of Soil Properties and Bearing Capacity of Mixed Pile
Foundation.” Major Advisor: Prof. Gong Xiaonan.
- B.S. Civil Engineering, Shandong University, P.R. China, 1995.

Professional Licensure

- Professional Engineer, State of California, License No. 71179. Since 2007
- Professional Engineer, State of Ohio, License No. 69837. Since January 7, 2005

Employments

- 2021 – present: Professor, Department of Civil and Environmental Engineering, The Pennsylvania State University, University Park.
- 2013 – 2021: Associate Professor, Department of Civil and Environmental Engineering, The Pennsylvania State University, University Park.
- 2011 – 2013: Associate Professor, Department of Civil and Geomatics Engineering, California State University, Fresno.
- 2005 – 2011: Assistant Professor, Department of Civil and Geomatics Engineering, California State University, Fresno.
- 2002 – 2005: Post-doctoral fellow and then Research Assistant Professor, Department of Civil Engineering, Kansas State University.
- 2001 – 2002: Scientific Staff, Research and Development Department, Nortel Networks, Richardson, Texas.
- 1998 – 2000: Graduate Research Assistant, Department of Civil Engineering, Kansas State University.

Research Areas:

- Performances of civil infrastructure under the effects of permafrost degradation in the Arctic
- Permafrost coastal erosion and remediation
- Design and performances of civil infrastructure (levees, dams, bridges, roads) from investigating fundamental mechanisms to field-scale performances using experimental and numerical methods
- Seepage and erosion.

RESEARCH

External Research Grants

Federal Funding (total funding of \$5,714,511 as project PI; \$2,906,031 as co-PI)

1. PI of NSF grant “SCC-CIVIC-PG Track A: Resilient Arctic Coastal Communities to Coastal Hazards,” funded by NSF CIVIC program, 10/01/2024 to 03/31/2025, total funding: \$75,000. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2431163&HistoricalAwards=false
2. PI of NSF grant “Conference: Convergence Approaches to Arctic Coasts,” funded by NSF Office of Polar Programs, 09/01/2023 to 08/31/2024, total funding: \$96,192. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2332253&HistoricalAwards=false
3. PI of NSF grant “2023 STEM Summer Camp for Indigenous Middle School Students in Utqiagvik, Alaska,” funded by NSF Office of Polar Programs, 03/15/2023 to 02/29/2024, total funding: \$49,615. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2312858&HistoricalAwards=false
4. Co-PI of HUD grant “Demonstration of Technical Feasibility and Cost Effectiveness of 3D Concrete Printing as an Alternative to Conventional Construction for Affordable Housing in Alaska’s Sub-Arctic Region” funded by U.S. Department of Housing and Urban Development (HUD), 01/01/2024 to 12/31/2024, total funding \$376,662.
5. PI of NSF grant “SitS: Collaborative Research: Understand and forecast long-term variations of in-situ geophysical and geomechanical characteristics of degrading permafrost in the Arctic,” funded by NSF Signals in the Soils (SitS) program, 01/01/2021 to 12/31/2023, total funding \$1,200,000. Project PI, with collaboration of University of Alaska Fairbanks, Virginia Tech. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2034363&HistoricalAwards=false
6. PI of NSF grant “NNA Track 1: Collaborative Research: Resilience and adaptation to the effects of permafrost degradation induced coastal erosion,” funded by NSF Navigating the New Arctic program, 09/01/2019 to 08/31/2024, total funding \$3,000,000. Project lead PI, with collaboration of University Alaska Fairbanks, University of Idaho, Missouri University of Science and Technology. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1927718&HistoricalAwards=false
7. Co-PI of NSF grant “Collaborative Research: AccelNet: Permafrost Coastal Systems Network (PerCS-Net) – a circumpolar alliance for arctic coastal community information exchange,” funded by NSF Accelerating Research through International Network-to-Network Collaborations (AccelNet), 10/01/2019 to 09/30/2023, total funding \$1,800,000. Lead PI: Benjamin Jones. Co-PI: Craig Tweedie. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1927553&HistoricalAwards=false
https://www.nsf.gov/awardsearch/showAward?AWD_ID=1927137&HistoricalAwards=false
8. PI of NSF grant “Convergence NNA: Coordinate a Transdisciplinary Research Network to Identify Challenges of and Solutions to Permafrost Coastal Erosion and Its Socioecological Impacts in the Arctic,” funded by NSF Arctic System Science program, 01/01/2018 to 12/31/2023, total funding \$500,000. Co-PIs: Vladimir Romanovsky, Kathleen Halvorsen, Guangqing Chi, Benjamin Jones. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1745369
https://www.nsf.gov/news/news_images.jsp?cntn_id=242889&org=NSF

9. PI of UTC project “Evaluation of an Innovative Erosion Control on Road Embankment Using Synthetic Turf with Sand Infill,” funded by U.S. DOT Region 3 University Transportation Center (UTC), 03/18/2019 – 03/17/2020; total federal funding \$49,077.
10. PI of DOI funding “Field Investigation and Stability Analysis of Coal Slurry Impoundments,” funded by Office of Surface Mining Reclamation & Enforcement (OSM), Department of Interior. Project duration: 10/01/2016 to 02/28/2019. Total federal funding: \$200,000; industrial and university match funding: \$99,110. Total project funding: \$299,110. Co-PIs: Dr. Shimin Liu and Dr. Jamal Rostami.
11. Co-PI of Rail Safety IDEA project “Development of Ballast Real Time Information System (BRIS) Based on ‘SmartRock’,” funded by TRB Rail Safety IDEA program, expected project duration 01/01/2017 to 12/31/2017, total funding: \$100,000. PI: Dr. Hai Huang, co-PI: Dr. Erol Tutumluer.
12. Co-PI of NSF grant “Characterization and Modeling of Multimechanistic Flow Behaviors from Nano- to Macro-scale in Shale Matrix,” funded by NSF CBET Fluid Dynamics program (CBET 1438398), 07/01/2014 to 06/30/2017, total funding: \$330,000. PI: Dr. Shimin Liu, co-PI: Dr. Derek Elsworth.
13. PI of FHWA project “Service Limit State Design and Analysis of Engineered Fills for Bridge Support,” funded by Federal Highway Administration (Contract DTFH61-14-C-00012), 04/23/2014 – 04/22/2017, total funding \$249,782. Co-PIs: Drs. Tong Qiu, James Withiam.
14. Single PI of NSF grant “Mobilization of Sand Particles and Erosion Progression Under Various Permeating Fluids,” funded by NSF CMMI Geomechanics and Geomaterials Program (CMMI 1200081 and CMMI-1346843), 09/01/2012 – 08/31/2016, total funding \$195,735.
http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1200081&WT.z_pims_id=13350
15. Co-PI of project “Flow and Distribution of Fluid Phases Through Porous Plant Growth Media in Microgravity,” funded by NASA Johnson Space Center, Oct 2002 – Mar 2005, total funding \$299,369.

State Funding (\$378,032 as PI; \$284,522 as co-PI):

1. PI of PennDOT project “GRS-IBS Specification Modification,” funded by Pennsylvania Department of Transportation, 02/20/2019 – 03/20/2020, total funding: \$99,606. Co-PIs: Dr. Xiaofeng Liu, Dr. Patrick Fox.
2. PI of PennDOT project “Evaluation of Geotextile Separation to Prevent Migration of Subgrade Fines into Subbase,” funded by Pennsylvania Department of Transportation, 11/24/2014 – 10/14/2016, total funding: \$221,948. Co-PIs: Drs. Shelley Stoffels, Tong Qiu.
3. Co-PI of PennDOT project “Evaluation on Aggregate Compaction Using Excavator-Mounted Hydraulic Plate Compactors,” funded by Pennsylvania Department of Transportation, 06/20/2018 – 06/19/2019, total funding: \$115,281. PI: Dr. Tong Qiu.
4. Co-PI of PennDOT project “Evaluation of Hydraulic Plate Compactor,” funded by Pennsylvania Department of Transportation, 08/26/2014 – 12/26/2014, total funding: \$111,930. PI: Dr. Tong Qiu.
5. Single PI of CalRecycle project “Large-Scale Testing of Shear Strength of Tire Derived Aggregates (TDA) and Pullout Strength of Geosynthetics in TDA,” funded by California Department of Resources Recycling and Recovery (CalRecycle), 01/01/2013 – 04/30/2013, total funding \$17,778.

6. PI of Caltrans project “Seismic Responses of MSE Walls Using Accelerated Alternative Backfill Materials with Recycled Tire Shreds and Lightweight Expanded Aggregates,” funded by California Department of Transportation, May 2012 – Jun 2013, total funding \$38,700.
7. Co-PI of project “Engineering Applications of KLA Compost Materials,” funded by Kansas Livestock Association (KLA), Nov 2004 – Oct 2005, total funding \$57,311.

Industry Funding (\$130,581 as PI):

1. Co-PI of project “Analyses of concrete samples with ingredients and engineering analysis of concrete 3D printed box shaped housing structure,” funded by Xtreme Habitats Institute (State of Alaska), 02/01/2021 - 06/30/2021, \$56,314 PI: Ali Memari.
2. PI of project “Evaluation of Erodibility of Sand Infill Placed in Synthetic Grass, Phases 1 to 7,” funded by Watershed Geosynthetics, LLC (Atlanta, GA), 04/01/2019 to 10/30/2022, total funding \$115,496. Co-PIs: Dr. Xiaofeng Liu, Dr. Hassan Ismail.
3. Single PI of project “Seismic Analyses of Slurry Walls,” funded by Magnus Pacific Corporation (Roseville, CA), July 2010 – June 2011, total funding \$25,000.
4. Single PI of project “Mechanisms and Prevention of Slurry-Induced Piping Progression,” funded by Magnus Pacific Corporation (Roseville, CA), July 2009 – June 2010, total funding \$25,883,

Internal Research Grants

At Penn State:

1. PI, “Acquisition of Laminar Shear Box for Seismic Shake Table,” \$19,872, funded by College of Engineering, 2014-2015.
2. Co-PI, “Investigation of flow Behaviors in Shales during Primary Gas Depletion and CO₂ Sequestration,” \$25,000, funded by Penn State Institutes of Energy and the Environment (PSIEE) 2014 Seed Grant Program, 2014-2015. PI: Shimin Liu.
3. Co-PI, “Experiment and Modeling of Multi-Physics Gas Flow Dynamics through MultiScale Shale Pores.” \$25,000, funded by Penn State Institutes of Energy and the Environment (PSIEE) 2018 Seed Grant Program, 2018-2019. PI: Shimin Liu.

At CSU Fresno:

1. The 2009 Claude C. Laval Jr. Award for Innovative Technology and Research: “Effects of Seismicity on Erosion and Strength of Levees”, \$5,000. California State University, Fresno. Only one Laval Award is given each year with applications from all disciplines and ranks on campus.
2. Co-PI. Research Activity Award, “Investigating Unstable Flow in Soils and its Impact on Groundwater Contamination,” with Z. Wang as PI, \$25,000. 2008-2009.
3. Co-PI. Research Activity Award, “Investment in the Future: Soil-Structure Interaction for Earthquake Applications,” with T. Attard as PI, \$25,000. 2007-2008.
4. PI of Award for Research, Scholarship and Creative Activities, “Seepage Study and Levee Design for the San Joaquin River Restoration Project,” \$5,000. 2007-2008.
5. PI of Award for Research, Scholarship and Creative Activities, “Application of Compost Soils on Roadside Erosion Control and Its Environmental Impact,” \$5,000. 2006-2007.

Research Activities as Graduate Student

1. PhD dissertation: “Modeling Fine Particle Clogging in Filters and Drainage Layers.” It was part of an NSF project “Development of Soil Filter Design Monographs Incorporating Physicochemical and Biological Mechanisms,” Jan 1998 – Dec 2000. Developed an experimentally verified numerical model to predict particle transport and clogging and permeability reduction in soil and geotextile filters and drainage systems.
2. MS research: “Reliability Study of Mixed Pile Foundation” funded by National Natural Science Foundation of China, at Zhejiang University, P.R. China, Sept 1995 – Dec 1997. Developed a reliability method to assess the soil characteristics and bearing capacity of mixed pile foundation using probabilistic analysis.

Books

1. Xiao, M. (2015). **Geotechnical Engineering Design**, 1st edition, April 2015. ISBN: 978-0-470-63223-9. 424 pages. WILEY Blackwell, Oxford, UK.
<http://www.wiley.com/buy/9780470632239>
2. Xiao, M. (2009). **Soil Testing Laboratory Manual**, 1st edition, January 2009. ISBN: 978-0-7575-9040-5. 161 pages. Kendall Hunt Publishing Company, Dubuque, IA, USA.
<https://he.kendallhunt.com/product/soil-testing-laboratory-manual>
3. *Proceedings of the 10th International Conference on Scour and Erosion (ICSE-10)*, USA, virtual conference. ISSMGE. 18-21 October, 2021. Rice, J., Liu, X., McIlroy, M., Sasanakul, I., and Xiao, M. (Eds). 1536 pages.

Journal Publications

(* indicates graduate students supervised by Dr. Xiao; ** indicates visiting scholars supervised by Dr. Xiao)

1. Ji*, X., Xiao, M., Martin, E., and Zhu, T. (2024) “Statistical Evaluation of Seismic Wave Velocity Models of Permafrost.” *ASCE Journal of Cold Regions Engineering*. 38(3): 04024021. <https://ascelibrary.org/doi/10.1061/JCRGEI.CRENG-760>
2. Tourei, A., Ji*, X., Santos, G., Czarny, R., Rybakov, S., Wang*, Z., Hallissey*, M., Martin, E.R., Xiao, M., Zhu, T., Nicolsky, D., Jensen, A. (2024) “Mapping permafrost variability and degradation using seismic surface waves, electrical resistivity and temperature sensing: a case study in Arctic Alaska.” *Journal of Geophysical Research - Earth Surface*. <http://dx.doi.org/10.1029/2023JF007352>
3. Wang*, Z., Xiao, M., Nicolsky, D., Romanovsky, V., McComb, C., Farquharson, L. (2023) “Arctic Coastal Hazard Assessment Considering Permafrost Thaw Subsidence, Coastal Erosion, and Flooding.” *Environmental Research Letters*, <https://doi.org/10.1088/1748-9326/acf4ac>
4. Alessa, L., Valentine, J., Moon, S., McComb, C., Sierra, H., Romanovsky, V., Xiao, M., Kliskey, A. (2023) “Treading on thawing ground: spatial integration of composite and temporal indices for critical infrastructure, community resilience, and national security with the permafrost vulnerability index.” *Geographies*. 3, 522–542. DOI: <https://doi.org/10.3390/geographies3030027>

5. Wang*, Z., **Xiao**, M., Liew, M., Jensen, A., Farquharson, L., Romanovsky, V., Nicolsky, D., McComb, C., Zhang, X., and Alessa, L. (2023) "Geohazard Risk Assessment Tools for Arctic Civil Infrastructure Planning: A Systematic Review." *Cold Regions Science and Technology*. Vol. 214, October 2023, 103969.
DOI: <https://doi.org/10.1016/j.coldregions.2023.103969>
6. Liew*, M., Ji*, X., **Xiao**, M., Farquharson, L., Nicolsky, D., Romanovsky, V., Bray, M., Zhang, X., and McComb, C. (2022) "Synthesis of physical processes of permafrost degradation and geophysical and geomechanical properties of permafrost-affected soils." *Cold Regions Science and Technology*. 198, 103522. DOI: <https://doi.org/10.1016/j.coldregions.2022.103522>
7. Liew*, M., **Xiao**, M., Farquharson, L., Nicolsky, D., Jensen, A., Romanovsky, V., Peirce, J., Alessa, L., McComb, C., Zhang, X., and Jones, B. (2022) "Understanding effects of permafrost degradation and coastal erosion on civil infrastructure in Arctic coastal villages: a community survey and knowledge co-production." *Journal of Marine Science and Engineering*. 10, 422. DOI: <https://doi.org/10.3390/jmse10030422>
8. Adams*, B.T., **Xiao**, M., and Gholizadeh-Vayghan, A. (2021) "Analytical study of the forces on a glass sphere under the effects of fluid's viscosity, pH, and ionic strength for flow-induced particle mobilization." *ASCE International Journal of Geomechanics*. 21(7): 04021110-1 to 04021110-8. DOI: [10.1061/\(ASCE\)GM.1943-5622.0002073](https://doi.org/10.1061/(ASCE)GM.1943-5622.0002073).
9. Salam*, S., **Xiao**, M., Khosravifar, A., and Ziotopoulou, K. (2021). "Seismic stability and liquefaction behavior of coal refuse tailings dams with pore pressure plasticity models considering spatial variability of the properties." *Computers and Geotechnics*. 132 (2021) 104017. DOI: <https://doi.org/10.1016/j.compgeo.2021.104017>
10. Ismail*, H., **Xiao**, M., Salam*, S., Scholl, B., and Liu, X. (2021) "Erodibility of sand infills in synthetic turfs on steep slopes using flume testing." *ASCE Journal of Hydraulic Engineering*. 147(8): 04021023. DOI: [10.1061/\(ASCE\)HY.1943-7900.0001891](https://doi.org/10.1061/(ASCE)HY.1943-7900.0001891)
11. Luo, Y., Zhang, X., and **Xiao**, M. (2020) "Influence of constriction-based retention ratio on suffusion in double-layered alluvial foundation with a cutoff wall." *Soils and Foundations*, 60 (2020), 1489-1506. DOI: <https://doi.org/10.1016/j.sandf.2020.10.002>
12. Prabhu, S., Qiu, T., Liew*, M., and **Xiao**, M. (2020). "Effects of lift thickness, backfill material, and compaction energy on utility trench backfill compaction using hydraulic plate compactors." *ASCE Journal of Pipeline Systems - Engineering and Practice*, 12(1), 04020054-1 to 04020054-10.
DOI: [https://doi.org/10.1061/\(ASCE\)PS.1949-1204.0000506](https://doi.org/10.1061/(ASCE)PS.1949-1204.0000506)
13. Salam*, S., **Xiao**, M., and Evans, J. (2020) "Strain history and short-period aging effects on the strength and cyclic response of fine-grained coal refuse." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*. 146(10): 04020113.
DOI: [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0002364](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002364)
14. Liew*, M., **Xiao**, M., Jones, B.M., Farquharson, L.M., and Romanovsky, V.E. (2020) "Prevention and control measures for coastal erosion in northern high-latitude communities: a systematic review based on Alaskan case studies." *Environmental Research Letters*. 15(9) DOI: <https://doi.org/10.1088/1748-9326/ab9387>
15. Khosrojerdi*, M., **Xiao**, M., Qiu, T., and Nicks, J. (2020) "Prediction equations for estimating maximum lateral deformation and settlement of geosynthetic reinforced soil abutments." *Computer and Geotechnics*. 125(2020) 103622.
DOI: <https://doi.org/10.1016/j.compgeo.2020.103622>

16. Khosrojerdi*, M., Qiu, T., **Xiao**, M., and Nicks, J. (2020). "Effects of backfill constitutive behavior on deformations of geosynthetic-reinforced soil piers under static axial loading." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*. 146(9) 04020072-1 to 04020072-10. DOI: [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0002313](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002313)
17. Gan**, L., Shen, Z., **Xiao**, M., and Wu, J. (2020). "Experimental investigation of seepage characteristics in porous rocks with a single fracture." *Hydrogeology Journal*, 28, 2933-2946. DOI: <https://doi.org/10.1007/s10040-020-02224-9>
18. Wang*, J., Salam*, S., and **Xiao**, M. (2020). "Evaluation of the effects of shaking history on liquefaction and cone penetration resistance using shake table tests." *Soil Dynamics and Earthquake Engineering*, 131, 106025. <https://doi.org/10.1016/j.soildyn.2019.106025>.
19. Liew*, M., **Xiao**, M., Liu, S., and Rudenko, D. (2020) "In situ seismic investigations for evaluating geotechnical properties and liquefaction potential of fine coal tailings." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, 146(5): 04020014-1 to 04020014-14. DOI: [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0002228](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002228)
20. Kermani*, B., Stoffels, S.M., and **Xiao**, M. (2020). "Evaluation of effectiveness of geotextile in reducing subgrade migration in rigid pavement." *Geosynthetics International*. 27(1), 97-109. DOI: <https://doi.org/10.1680/jgein.19.00052>
21. Luo**, Y., Luo, B., and **Xiao**, M. (2020) "Effect of deviator stress on the initiation of suffusion." *Acta Geotechnica*, 15, 1607–1617. DOI: <https://doi.org/10.1007/s11440-019-00859-x>
22. Cui, W., and **Xiao**, M. (2020). "Centrifuge modeling of geogrid-reinforced and rammed soil-cement column-supported embankment on soft soil." *ASTM Journal of Testing and Evaluation*. 48(5) 4016-4029. DOI: <https://doi.org/10.1520/JTE20170603>.
23. Zeng, K., Qiu, T., Bian, X., **Xiao**, M., and Huang, H. (2019). "Identification of ballast condition using "SmartRock" and pattern recognition." *Construction and Building Materials*, Vol. 221, 50-59. DOI: <https://doi.org/10.1016/j.conbuildmat.2019.06.049>
24. Salam*, S., **Xiao**, M., Khosravifar, A., Liew*, M., Liu, S., and Rostami, J. (2019) "Characterizations of static and dynamic geotechnical properties and behaviors of fine coal refuse." *Canadian Geotechnical Journal*, 56(12), 1901-1916. DOI: <https://doi.org/10.1139/cgj-2018-0630>
25. Ma*, Y., **Xiao**, M., and Kermani*, B. (2019) "Experimental investigation of the effects of fluid's physicochemical characteristics on piping erosion of a sandy soil under turbulent flow." *ASTM Geotechnical Testing Journal*, 43(2), 436-451. DOI: <https://doi.org/10.1520/GTJ20180396>
26. Wang*, J., **Xiao**, M., Evans, J., and Qiu, T., and Salam*, S. (2019) "Time-dependent cone penetration resistance of a post-liquefaction sand deposit at shallow depth." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*. 145(6), 04019021-1 to 04019021-12. DOI: [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0002049](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002049)
27. Khosrojerdi*, M., **Xiao**, M., Qiu, T., and Nicks, J. (2019) "Nonlinear equation for predicting the settlement of reinforced soil foundations." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*. 145(5): 04019013-1 to 04019013-8. DOI: [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0002027](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002027)
28. Kakuturu, S., **Xiao**, M., Kinzel, M. (2018). "Effects of maximum particle size on the results of hydrometer tests on soils." *ASTM Geotechnical Testing Journal*. 42(4), 945-965. DOI: <https://doi.org/10.1520/GTJ20170236>
29. Kermani*, B., **Xiao**, M., and Stoffels, S.M. (2018) "Analytical study on quantifying the magnitude and rate of subgrade fines migration into subbase under flexible pavement."

- Transportation Geotechnics*. 18, 46-56. DOI: <https://doi.org/10.1016/j.trgeo.2018.11.003>
30. Jones, B.M., Farquharson, L.M., Baughman, C.A., Buzard, R.M., Arp, C.D., Grosse, G., Bull, D.L., Guenther, F., Urban, F., Kasper, J.L., Frederick, J.M., Thomas, M., Jones, C., Mota, A., Dallimore, S., Tweedie, C., Maio, C., Mann, D.H., Richmond, B., Gibbs, A., **Xiao**, M., Sachs, T., Iwahana, G., Kanevskiy, M., and Romanovsky, V.E. (2018) “A decade of remotely sensed observations highlight complex processes linked to coastal permafrost bluff erosion in the Arctic.” *Environmental Research Letters*. 13(11), 115001 (13 pages). DOI: <https://doi.org/10.1088/1748-9326/aae471>
 31. Kermani*, B., Stoffels, S.M., **Xiao**, M., and Qiu, T. (2018) “Experimental simulation and quantification of migration of subgrade soil into subbase under rigid pavement using model mobile load simulator.” *ASCE Journal of Transportation Engineering, Part B: Pavements*. 144(4): 04018049 (14 pages) DOI: <https://doi.org/10.1061/JPEODX.0000078>
 32. Liew*, M., **Xiao**, M., and Liu, S. (2018) “Characterization of physical and mineralogical properties of coal tailings of different ranks.” *International Journal of Coal Preparation and Utilization*. (16 pages). DOI: <https://doi.org/10.1080/19392699.2018.1503175>
 33. Kermani*, B., **Xiao**, M., Stoffels, S.M., Qiu, T. (2018). “Reduction of subgrade fines migration into subbase of flexible pavement using geotextile.” *Geotextiles and Geomembranes*, Technical note. 46(4): 377–383.
DOI: <https://doi.org/10.1016/j.geotexmem.2018.03.006>
 34. **Xiao**, M., Gholizadeh-Vayghan*, A., Adams*, B.T., and Rajabipour, F. (2018) “Experimental investigation of the relative and interactive effects of physicochemical fluid characteristics on the incipient motion of granular particles under laminar flow conditions.” *ASCE Journal of Hydraulic Engineering*. 144(5): 04018013-1 to 04018013-14. DOI: [https://doi.org/10.1061/\(ASCE\)HY.1943-7900.0001451](https://doi.org/10.1061/(ASCE)HY.1943-7900.0001451)
 35. Kermani*, B., **Xiao**, M., Stoffels, S. M., Qiu, T. (2017). “Measuring the migration of subgrade fine particles into subbase using scaled accelerated flexible pavement testing – a laboratory study.” *Road Materials and Pavement Design*. 20(1), 36-57. DOI: <https://doi.org/10.1080/14680629.2017.1374995>
 36. Luo**, Y., Nie, M., and **Xiao**, M. (2017) “Flume-scale experiments on suffusion at the bottom of cutoff wall in sandy gravel alluvium.” *Canadian Geotechnical Journal*, 54(12), 1716-1727. DOI: <https://doi.org/10.1139/cgj-2016-0248>
 37. Wang, C., Qiu, T., **Xiao**, M., and Wang*, J. (2017) “Utility trench backfill compaction using vibratory roller compactor versus hydraulic plate compactor.” *ASCE Journal of Pipeline Systems Engineering and Practice*. 8(4): 04017021-1 to 04017021-10. (10 pages). DOI: [https://doi.org/10.1061/\(ASCE\)PS.1949-1204.0000284](https://doi.org/10.1061/(ASCE)PS.1949-1204.0000284)
 38. Xue**, X., and **Xiao**, M. (2017) “Deformation evaluation on surrounding rocks of underground caverns based on PSO-LSSVM.” *Tunneling and Underground Space Technology*. 69: 171-181. DOI: <https://doi.org/10.1016/j.tust.2017.06.019>
 39. Cui, X., Zhang, J., Huang, D., **Xiao**, M., Hou, F., Liu, Z., and Li, L. (2017) “Analysis of vehicle-force-induced dynamic pore pressure in saturated pavement with LSPM drainage base.” *ASTM Journal of Testing and Evaluation*, 45(1), 294-302.
DOI: <https://doi.org/10.1520/JTE20160172>
 40. Xue**, X., and **Xiao**, M. (2016) “Application of adaptive neuro-fuzzy inference system for prediction of internal stability of soils.” *European Journal of Environmental and Civil Engineering*. 23(2), 153-171. DOI: <https://doi.org/10.1080/19648189.2016.1271363>
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- Min Liew, Ming Xiao, Louise Farquharson, Dmitry Nicolsky, Anne Jensen, Vladimir Romanovsky, Jana Peirce, Lilian Alessa, Christopher McComb, Xiong Zhang, and Benjamin Jones (2023) “Community survey data of permafrost thaw, coastal erosion, and

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Reports

1. **Xiao, M.**, Druckenmiller, M., Maio, C., Jones, B., Garland, A., Miller-Hooks, E., Petrov, A., Ferreira, C., and Ferguson, C., Balazs, M., Ravens, T., Burnsilver, S., York, A., Vater, J., Wang, Z. (2024) Report of 2023 Arctic Coasts Workshop: Changes, Impacts, and Solutions - Working Towards a Resilient Future. October 9 – 11, 2023, University of Colorado Boulder.
2. **Xiao, M.**, Liu, X., and Ismail, H. (2021) “Evaluation of Erodibility of Sand Infill Placed in Synthetic Grass, Phase 6.” Submitted to Watershed Geosynthetics (Alpharetta, GA). June 30, 2021.
3. **Xiao, M.**, Liu, X., and Fox, P.J. (2020) “GRS-IBS Specification Modification.” Technical Report submitted to Pennsylvania Department of Transportation, Report No. FHWA-PA-012-PSU WO 012, 74 pp, March 2020.
4. **Xiao, M.**, Liu, X., and Ismail, H. (2020) “Evaluation of Erodibility of Sand Infill Placed in Synthetic Grass, Phase 2.” Submitted to Watershed Geosynthetics (Alpharetta, GA). January 31, 2020.
5. **Xiao, M.**, Liu, X., and Ismail, H. (2019) “Evaluation of Erodibility of Sand Infill Placed in Synthetic Grass, Phase 1.” Submitted to Watershed Geosynthetics (Alpharetta, GA). October 31, 2019.
6. **Xiao, M.**, Liew, M., Salam, S., Liu, S., Rostami, J. (2019). “Field Investigation and Stability Analysis of Coal Slurry Impoundments.” *Rep. No. S16AC20074, U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement.* 249 pp. January 31, 2019.
7. Qiu, T., and **Xiao, M.**, Prabhu, S., and Liew, M. (2019) “Evaluation of Aggregate Compaction Using Excavator-mounted Hydraulic Plate Compactors.” Report submitted to Pennsylvania Department of Transportation. Larson Transportation Institute, The Pennsylvania State University, April 2019. FHWA-PA-002-PSU WO 002, 145pp.
8. **Xiao, M.**, Qiu, T., Khosrojerdi, M., and Withiam, J. (2017). “Service Limit State Design and Analysis of Engineered Fills for Bridge Support.” FHWA Final Report, U.S. Department of Transportation, Federal Highway Administration, Research, Development, and Technology, Turner-Fairbank Highway Research Center, McLean, VA. 255 pp, Oct 2017.
9. **Xiao, M.**, Stoffels, S., Qiu, T., and Kermani, B. (2016). “Evaluation of Geotextile Separation to Prevent Migration of Subgrade Fines into Subbase.” Technical Report submitted to Pennsylvania Department of Transportation, Report No. FHWA-PA-2016-007-PSU WO 9C, 383 pp, Oct 2016.
10. **Xiao, M.**, Qiu, T., Khosrojerdi, M., Basu, P., and Withiam, J. (2016). “Synthesis and Evaluation of the Service Limit State of Engineered Fills for Bridge Support.” FHWA Synthesis Report, PUBLICATION NO. FHWA-HRT-15-080, publication date February 2016, 151 pp. U.S. Department of Transportation, Federal Highway Administration, Research, Development, and Technology, Turner-Fairbank Highway Research Center, McLean, VA.

11. Qiu, T., and **Xiao, M.**, and Wang, C. (2014) “Evaluation of Hydraulic Plate Compactor.” Report submitted to Pennsylvania Department of Transportation. Larson Transportation Institute, The Pennsylvania State University, December 2014. FHWA-PA-2014-008-PSU WO 12A. 102 pp.
12. **Xiao, M.** (2013). “Large-Scale Testing of Shear Strength of Tire Derived Aggregates (TDA) and Pullout Strength of Geosynthetics in TDA.” Project Report submitted to California Department of Resources Recycling and Recovery (CalRecycle), May 2013. 31pp.
13. **Xiao, M.**, Tehrani, F.M., and Zoghi, M. (2013). “Seismic Responses of MSE Walls Using Accelerated Alternative Backfill Materials with Recycled Tire Shreds and Lightweight Aggregates.” Final Report submitted to the California Department of Transportation (Caltrans) under contract No. 65A0449. Final Report No. CA 13-2416. Aug 2013. 86pp.

Invited Presentations

1. Tourei, A., Ji, X., Santos, G., Czarny, R., Rybakov, S., Wang, Z., Hallissey, M., Martin, E.R., **Xiao, M.**, Zhu, T., Nicolsky, D., Jensen, A. (2023) “Characterizing the spatial variability of permafrost using seismic surface waves, electrical resistivity, and temperature sensing.” S33B-0636. AGU Fall Meeting, San Francisco, CA. December 11 to 15, 2023.
2. Ji, X., Santos, G., Tourei, A., Wang, Z., Hallissey, M., **Xiao, M.**, Zhu, T., Martin, E.R., Nicolsky, D., and Jensen, A. (2023) “Seasonal changes and degradation of roadside permafrost in utqiagvik, Alaska using in-situ distributed acoustic and temperature sensing.” C33D-1432, AGU Fall Meeting, San Francisco, CA. December 11 to 15, 2023.
3. Hallissey, M., Rubino, I., and **Xiao, M.** (2023) “2023 STEM Summer Camp for Indigenous Middle School Students in Utqiagvik, Alaska.” C31E-1391, AGU Fall Meeting, San Francisco, CA. December 11 to 15, 2023.
4. Wang, Z., **Xiao, M.**, Nicolsky, D., Romanovsky, V., McComb, C., and Farquharson, L. (2023) “Arctic Coastal Hazard Index (ACHI): A Framework for Assessing Vulnerability to Permafrost Thawing, Coastal Erosion, and Flooding in the Arctic.” C33C-1416, AGU Fall Meeting, San Francisco, CA. December 11 to 15, 2023.
5. **Xiao, M.** (2023) “Arctic Coastal Hazard Assessment Considering Permafrost Thaw Subsidence, Coastal Erosion, and Flooding.” 2023 Permafrost & Infrastructure Symposium, Prudhoe Bay, AK, Aug 1-6, 2023.
6. **Xiao, M.** (2023) “Multi-scale spatiotemporal monitoring of permafrost degradation using distributed acoustic and temperature sensing.” **Keynote speaker.** 13th International Symposium on Cold Regions Development, Harbin, China, July 14 - 15, 2023.
7. **Xiao, M.** (2023) “Multi-scale spatiotemporal monitoring of permafrost degradation using distributed acoustic and temperature sensing.” Arctic Science Summit Week (ASSW) 2023, RATIC (Rapid Arctic Transitions due to Infrastructure and Climate) Cross-Disciplinary Workshop, Towards Sustainable Infrastructure: Environmental, Technological, and Societal Impacts of Development in the Arctic. February 20, 2023. Online.
8. Dos Santos, G., Czarny, R., Roth, N., Zhu, T., Tourei, A., Martin, E.R., Ji, X., Liew, M., Jensen, A.M., Nicolsky, D., and **Xiao, M.** (2022) “Identification of Cryoseismic Events in Utqiagvik, Alaska Using Distributed Acoustic Sensing (DAS).” NS45B-0326, AGU Fall Meeting, Chicago, IL. December 12 to 16, 2022.
9. Tourei, A., Martin, E.R., Dos Santos, G., Czarny, R., Roth, N., Zhu, T., Ji, X., Liew, M., Jensen, A.M., Nicolsky, D., and **Xiao, M.** (2022) “Exploration and Quality Control of Large-

- scale Distributed Acoustic Sensing Data to Study Permafrost Degradation in Arctic Alaska.” NS22B-0291. AGU Fall Meeting, Chicago, IL. December 12 to 16, 2022.
10. **Xiao, M.** (2022) “Effects of permafrost degradation and coastal erosion on four Alaska North Slope Borough coastal communities: Survey through knowledge co-production.” Arctic Outreach Fair at the 2022 Alaska Forum on the Environment (AFE), February 8, 2022. Virtual.
 11. **Xiao, M.** (2021) “Cyclic Behavior of Coal Tailings and Seismic Stability of Coal Tailings Dams.” MSHA 2021 Dam Safety Training, May 14, 2021. Virtual. Mine Safety and Health Administration (MSHA)
 12. **Xiao, M.** (2021) “Permafrost Degradation and Its Impact on Natural Environment, Infrastructure, and Society in the Arctic.” Virtual Graduate Seminar, Department of Civil and Environmental Engineering, University of Illinois, on 11/05/2021.
 13. **Xiao, M.** (2021) “Developing a Convergent Research Coordination Network to Identify Challenges of and Solutions to Permafrost Coastal Erosion and Its Socioecological Impacts in the Arctic.” *The 10th International Conference on Scour and Erosion (ICSE-10)*, Session: Erosion and Structures, virtual conference, 19 October, 2021.
 14. **Xiao, M.** (2021) “Survey and Analysis of Design Parameters of Waterway-Crossing GRS-IBS Bridges: The State of U.S. Practice.” *The 10th International Conference on Scour and Erosion (ICSE-10)*, Session: River, Coastal, Estuarine, and Marine Scour and Erosion, virtual conference, 20 October, 2021.
 15. **Xiao, M.** (2021) “Prevention and Control Measures for Coastal Erosion in Northern High-Latitude Communities” At the virtual conference of the University of the Arctic (UArctic) Congress, session “Arctic Coastal Hazards and the Role of Risk Mitigation and Infrastructure Development in Community Resilience.” May 18, 2021.
 16. **Xiao, M., Romanovsky, V., Jones, B., Farquharson, L., Halvorsen, K., and Chi, G.** (2019) “Convergence NNA: Coordinate a transdisciplinary research network to identify challenges of and solutions to permafrost coastal erosion and its socioecological impacts in the Arctic.” Poster presentation, in session Growing Pains: Overcoming Obstacles and Working Together to Improve Research Coordination. AGU Fall Meeting 2019. December 9-13, 2019. San Francisco, CA.
 17. **Liew, M., Xiao, M., Jones, B., Romanovsky, V., Farquharson, L.** (2019) “Engineering Challenges and Options in Remediation and Prevention of Permafrost Coastal Erosion.” Poster presentation, in session Arctic Coastal Changes, Hazards, and Risks: Circumpolar Truths and Future Outcomes II Posters. AGU Fall Meeting 2019. December 9-13, 2019. San Francisco, CA.
 18. **Xiao, M.** (2018). “Rainfall Erosion Resistance and Stability of Various Composts.” 25th Annual Environmental Conference of the Mid-Atlantic Chapter (MAC) of the International Erosion Control Association (IECA), September 18 - 20, 2018, Harrisburg, PA
 19. **Xiao, M.** (2018). “Time-Dependent Cone Penetration Resistance of a Post-Liquefaction Sand Deposit at Shallow Depth.” **Session Keynote Speaker.** Soil Dynamics Session. The 4th GeoShanghai International Conference, May 27-30, 2018. Shanghai, China.
 20. **Xiao, M.** (2017). “Human-Infrastructure Interdependencies and Resilience in Response to Extreme Events.” Resilience Week 2017, Wilmington, DE, Sept 19–21, 2017.
 21. **Xiao, M.** (2016). “Development of experimental methodology of investigating the relative and interactive effects of physicochemical properties of permeating fluids on incipient

- motion of granular particles.” *Proceedings of the 8th International Conference on Scour and Erosion*, Oxford, UK, Sept 12–15, 2016.
22. **Xiao**, M. (2016). “Particle Transport in Porous Media in Geotechnical Engineering and Beyond.” Workshop on Geotechnical Fundamentals in the Face of New World Challenges, NSF, Arlington, Virginia, July 17 - 19, 2016.
 23. **Xiao**, M. (2014) “Mobilization of sand particles and erosion progression under various permeating fluids.” Seminar at Syracuse University, Department of Civil and Environmental Engineering, April 18, 2014.
 24. **Xiao**, M. (2014) “Mobilization of Sand Particles and Erosion Progression under Various Permeating Fluids.” Fluid Dynamics Research Consortium seminar, Pennsylvania State University, University Park, PA. April 10, 2014.
 25. **Xiao**, M (2014). “Large-scale shear testing of tire derived aggregates (TDA).” *2014 Geo-Congress: Geo-Characterization and Modeling for Sustainability*, Atlanta, GA, Feb 23-26, 2014.
 26. **Xiao**, M, (2014). “Shake table test to investigate seismic responses of a slurry wall.” *2014 Geo-Congress: Geo-Characterization and Modeling for Sustainability*, Atlanta, GA, Feb 23-26, 2014.
 27. Adams*, B., **Xiao**, M. (2014). “Microscopic experimental study on seepage-induced granular particle mobilization.” *2014 Geo-Congress: Geo-Characterization and Modeling for Sustainability*, Atlanta, GA, Feb 23-26, 2014.
 28. **Xiao**, M. (2014). “Shake table testing and numerical analyses of seismic responses of mechanically stabilized earth wall with tire-derived aggregate backfill.” The 93 TRB Annual Meeting, Session 739 “Performance of Transportation Geosystems Under Service and Extreme Loading Conditions.” Jan 11 – 15, 2014, Washington, D.C.
 29. **Xiao**, M. (2013). “Seismic performance of mechanically stabilize earth wall with lightweight aggregate (LWA) backfill.” *Geosynthetics 2013*, Session: Geosynthetic Reinforced Soil–Integrated Bridge System: Design, Construction, and Performances, IFAI, Long Beach, CA, April 1–4, 2013.
 30. **Xiao**, M. (2013). “Shake table tests of MSE walls with tire derived aggregates (TDA) backfill.” *2013 Geo-Congress*, ASCE, San Diego, CA, March 3–6, 2013.
 31. Graham*, M., and **Xiao**, M. (2012). “Seismic performances of slurry walls.” ASCE 2012 GeoCongress, session: Seismic design of retaining structures. Oakland, CA, March 26, 2012.
 32. **Xiao**, M. (2012). “Biological mechanisms of piping erosion reduction of organic soils.” ASCE 2012 GeoCongress, session: Scour and erosion. Oakland, CA, March 29, 2012.
 33. **Xiao**, M. (2012). “Comparison of seismic responses of geosynthetically-reinforced bridge abutments with tire derived aggregate (TDA) and granular backfills.” 134th Transportation Research Board Meeting (*TRB 2012*), Washington, D.C., Jan 23, 2012.
 34. Adams*, B.T., and **Xiao**, M. (2011). “Bioremediation of internal erosion in sand.” *Geo-Frontiers 2011*, Annual Geo-Congress of the Geo-Institute of ASCE, Dallas, TX, March 13-16, 2011.
 35. Sinco*, E., **Xiao**, M. (2010). “Piping of sand under different permeating fluid.” *The 5th International Conference on Scour and Erosion*, San Francisco, CA, Nov 7–10, 2010.
 36. Adams*, B.T., and **Xiao**, M. (2010). “Piping mechanisms of a fibrous peat.” *The 5th International Conference on Scour and Erosion*, Nov 7-10, 2010, San Francisco, CA.

37. Shwiyhat*, N., and **Xiao, M.** (2010). "Effect of suffusion on mechanical characteristics of sand." *The 5th International Conference on Scour and Erosion*, San Francisco, CA, Nov 7–10, 2010.
38. **Xiao, M.** (2010). "Discontinuous pore fluid distribution under microgravity." The 2nd International Workshop on Multiscale and Multiphysics Processes in Geomechanics, Stanford University, poster presentation, June 23–25, 2010. Poster presentation.
39. **Xiao, M.** (2010). "Effect of piping on shear strength of levees." GeoShanghai 2010 International Conference. Shanghai, China, June 3–6, 2010.
40. **Xiao, M.** (2010). "Experimental study of subsurface erosion of peats." ASCE 2010 Geo-Congress. West Palm Beach, FL. Feb 20–24, 2010.
41. **Xiao, M.** (2009). "Erosion and stability of California's levee system – current status and research." The 4th World Forum of Chinese Scholars in Geotechnical Engineering, Wu Han, China. Aug 20–21, 2009.
42. **Xiao, M.** (2008). "Internal erosion of California's levee system." Consulting Engineers & Land Surveyors of California (CELSOC) monthly meeting, Fresno, CA, May 14, 2008.
43. **Xiao, M.** (2008) "Rainfall erosion resistance of various compost soils on roadside embankment." 2008 Annual Congress of the Geo-Institute of ASCE, New Orleans, LA, March 9–12, 2008.
44. **Xiao, M.** (2007). "Erosion control using compost soil on roadside embankment." The 28th Annual Central California Research Symposium, Fresno, CA. April 12, 2007.
45. **Xiao, M.**, and Reddi, L.N. (2006). "Fluid distribution in porous media under microgravity." GeoShanghai 2006 International Conference, Session: Seepage and Drainage in Porous Media. Shanghai, China. June 6, 2006.
46. **Xiao, M.**, Reddi, L.N., Howard (2006) "Rainfall erosion control on roadside embankment using compost soils." Advances in Unsaturated Soil, Seepage, and Environmental Geotechnics, GeoShanghai International Conference, Shanghai, China. June 6–8, 2006.
47. **Xiao, M.** and Reddi, L.N. (2004). "Effect of vibrations on pore fluid distribution in porous media—experimental investigations." The 9th ASCE Aerospace Division International Conference on Engineering, Construction and Operations in Challenging Environments (Earth and Space 2004), Houston, Texas, March 2004.
48. **Xiao, M.** (2000). "Comparison of fine particle clogging in soil and geotextile filters." Geo-Denver 2000, ASCE Geo-Institute, Denver, Colorado, August 2000.
49. **Xiao, M.** and L.N. Reddi (1999). "Modeling permeability changes due to particle transport." 1999 Conference on Hazardous Waste Research, Great Plains/Rocky Mountain Hazardous Substance Research Center, St. Louis, Missouri. May 1999.

STUDENT ADVISING

Current Students (with Xiao as major advisor)

1. Xiaohang Ji, PhD candidate. Dissertation: “Understand Seasonal Variations of In-Situ Thermal and Seismic Characteristics of Degrading Permafrost in the Arctic Based on Distributed Fiber Optic Sensing.” Aug 2020 – present.
2. Zoey Wang, PhD candidate. Dissertation “Infrastructure Hazard Assessment under the Effects of Permafrost Degradation in the Coastal Region of Northern Alaska.” Aug 2021 – present.
3. Xueyang Wang, PhD student. Dissertation: “Multi-Function Geophysical Subsurface Imaging of Permafrost.” Aug 2023 – present.
4. Matthew Hallissey, M.S. student (NSF GRFP recipient). Thesis: “Development of Electromagnetic Geophysical Surveys for Permafrost Using Unmanned Aerial System.” Aug 2023 – present.
5. Isabel Rubino, B.S. student (NSF REU recipient), Sept 2022 – present

Former graduate students (with Xiao as major advisor)

PhD Graduates:

1. Min Liew, PhD, Aug 2022, Penn State University. Dissertation: “Permafrost Degradation and Coastal Erosion and Their Potential Impacts on Civil Infrastructure in the Arctic.”
2. Sajjad Salam, PhD, Aug 2020, Penn State University. Dissertation: “Cyclic Behavior of Fine Coal Refuse and Seismic Stability of Coal Tailings Dams.”
3. Benjamin Adams, PhD, Aug 2020, Penn State University. Dissertation “Experimental and Analytical Investigations of the Relative and Interactive Effects of Physicochemical Fluid Characteristics on the Incipient Motion of Granular Particles Under Laminar Flow Conditions.”
4. Jintai Wang, PhD, Aug 2018, Penn State University. Dissertation: “Seismic Performances of a Liquefiable Sand Deposit Using 1-G Shake Table Testing Considering Aging and Shaking History Effects and the Numerical Simulation of Sand Liquefaction.”
5. Mahsa Khosrojerdi, PhD, Aug 2018, Penn State University. Dissertation “Service Limit State Design and Analysis of Engineered Fills for Bridge Support.” Co-advisor, Dr. Tong Qiu.
6. Behnoud Kermani, PhD, May 2018, Penn State University. Dissertation “Experimental and Numerical Study of Subgrade Soil Migration into Pavement Subbase and Mitigation Using Geotextile.” Co-advisor, Dr. Shelley Stoffels.

M.S. Graduates:

1. Chih-Chun Tang, M.S., Dec 2022, Penn State University. Thesis “Evaluation of Erodibility of Sand Infill Placed in Synthetic Grass.”
2. Yen-Chieh Wang, M.S., May 2019, Penn State University. Thesis “Synthesis of Geotechnical Properties of Tailings.”
3. Rong Zhao, M.S., May 2019, Penn State University. Thesis “Evaluation of Liquefaction Potential and In-Situ Geotechnical Properties of Coal Slurries in Shake Table Testing Using Cone Penetration Test.”

4. Maria Lissette Beltri, M.S., Dec 2018, Penn State University. Thesis “Hurricane-Induced Coastal Soil Erosion – Review and Synthesis.”
5. Min Liew, M.S., Aug 2018, Penn State University. Thesis “Field and Laboratory Characterizations of In-Situ Coal Slurry.”
6. Yuetan Ma, M.S., May 2018, Penn State University. Thesis “The Effects of Fluid’s Physicochemical Characteristics on Piping Erosion Progression of a Silty Sand.”
7. Anthony Cemo, M.S., Dec 2013, California State University, Fresno. Project “Development of an Experimental Imaging System for the Micro-Scale Study of Seepage-Induced Granular Particle Mobilization.”
8. Martine Ledezma, M.S., May 2013, California State University, Fresno. Thesis “Improved Shake Table Tests on the Seismic Responses of Slurry Walls.”
9. Corbin Hartman, M.S., May 2013, California State University, Fresno. Thesis “Seismic Responses of MSE Walls Using Accelerated Alternative Backfill Materials with Tire Derived Aggregate (TDA) and Lightweight Aggregates (LWA).”
10. Jan Bowen, MS, Dec 2011, California State University, Fresno. Project “Seismic Responses of Bridge Abutments with Tire Derived Aggregate (TDA) Backfill.”
11. Mathew Graham, M.S., Dec 2011, California State University, Fresno. Thesis “Seismic Analysis of Slurry Walls.”
12. Exequiel Sinco, M.S., May 2011, California State University, Fresno. Thesis “Piping Progression of Sand under Various Permeating Fluids.”
13. Benjamin Adams, M.S., May 2011, California State University, Fresno. Thesis “Piping Erosion Mechanisms of Organic Soils and Bioabatement of Piping Erosion of Sand.”
14. Nathan Shwiyhat, M.S., Dec 2010, California State University, Fresno. Thesis “Geo-mechanical Effects on Suffusion of Sand-Kaolinite Mixtures.”
15. Jose Gomez, M.S., Dec 2009, California State University, Fresno. Thesis “Effect of Piping on Shear Strength of Soils.”

Undergraduate students in Research Experience for Undergraduates (REU) supported by College of Engineering, Penn State and NSF

1. Isabel Rubino, Civil Engineering, 2022-present. NSF NNA REU program, 2022-2023.
2. Matthew Hallissey, Civil Engineering, NSF NNA REU program, 2022-2023.
3. Kehinde Azezat Ololade Sokunbi, Civil Engineering, Equity REU program, Spring 2019.
4. Scott Carbaugh, Mechanical Engineering, Penn State Harrisburg, summer 2018.
5. Daniel Duran Esmeral, Civil Engineering, Spring 2018. Daniel went to pursue M.S. at Imperial College London.
6. Andrew Bechtold (Schreyer Scholar), Civil Engineering, Spring 2017.
7. Danielle Berman (Schreyer Scholar), Fall 2015. Danielle went to pursue Ph.D. at Penn State.
8. Kristin Beckman, Penn State Harrisburg, Summer 2015.

Ph.D. Dissertation Committee Member

1. Anshu Abhinav, Ph.D. student, Civil Engineering. Dissertation title: “Coupled Thermo-Hydro-Electromagnetic Properties of Permafrost.” Department of Civil and Environmental Engineering, University of Illinois Urbana-Champaign (2023-present)
2. Mohammad Akhsanul Islam, Ph.D. student, Civil Engineering. Dissertation title: “Numerical Modelling of Arctic Coastal Erosion.” Department of Civil and Environmental Engineering, Norwegian University of Science and Technology (NTNU) (2023)

3. Tei Pei, Ph.D. student, Civil Engineering. Dissertation title: “Dynamic Hazard Assessment for Rainfall-Induced Landslides Using Physics-Guided Machine Learning.” (August 2020 – August 2023).
4. Chu Wang, Ph.D. student, Civil Engineering. Dissertation title: “Coupled Large Strain Consolidation and Heat Transfer.” (August 2016 – present).
5. Kun Zeng, Ph.D. student, Civil Engineering. Dissertation title: “Real Time Load Rating for Railroad Bridges.” 2021. Graduated.
6. Sudheer Prabhu, Ph.D. student, Civil Engineering. Dissertation title: “Mechanical Behavior of Sands Under Impact Loading.” 2021. Graduated
7. Fengyuan Zhang, Ph.D. student, Petroleum and Natural Gas Engineering. Dissertation title: “Multiphase Flowback Rate Transient Analysis for Shale Gas Reservoirs.” (2019 – present).
8. Mehrshad Amini, Ph.D. student, Civil Engineering. Dissertation title: “Probabilistic Hazard Analysis Framework for Evaluation of Retrofitted Coastal Residential Buildings under Combined Hurricane Wind and Surge Flood.” (2018 – present).
9. Amir Ahmadipur, Ph.D., Civil Engineering. Dissertation title: “Experimental and Analytical Investigation of Impact Force from a Dry Granular Sliding Mass on a Rigid Obstruction.” August 2018. Graduated.
10. Shushu Liu, Ph.D., Civil Engineering. Dissertation title: “Sensing Mechanism and Real Time (SMART) Computing for Granular Materials.” August 2018. Graduated
11. Elnaz Kermani, Ph.D., Civil Engineering. Dissertation title: “Fluid-Solid Interaction through Coupled Discrete Element Method and Smoothed Particle Hydrodynamics Simulations.” May 2018. Graduated.
12. Zhenzihao Zhang, Ph.D., Energy and Mineral Engineering. Dissertation title: “Predicting Petrophysical Properties from Rate-Transient Data: An Artificial Intelligence Application.” May 2017. Graduated.
13. Yi Wang, Ph.D., Energy and Mineral Engineering. Dissertation title: “Laboratory Estimation and Modeling of Apparent Permeability for Ultra-Tight Anthracite and Shale Matrix: A Multi-mechanistic Flow Approach.” May 2017. Graduated.
14. Mina Mohebbi, Ph.D., Civil Engineering. Dissertation title: “Enhancing the beneficial applications of fly ash in concrete and in mine reclamation: Measurement of unburned carbon content and long-term leaching of potentially harmful elements.” May 2017. Graduated.

M.S. Thesis Committee Member

1. Xu Zhao, M.S., Energy and Mineral Engineering. Thesis title: “Investigations of Gas Sorption-Induced Strain for Sorptive Rocks Using a New Optical Method.” August 2015.
2. Chaoyi Wang, M.S., Civil Engineering. Thesis title: “Effect of Hydraulic Plate Compactor and Lift Thickness on Utility Trench Backfill Compaction.” May 2015. Graduated.
3. Chu Wang, M.S., Civil Engineering. Thesis title: “Prediction of Consolidation Times for Shear Strength Testing of Geosynthetic Clay Liners Using CS2 Model.” December 2016. Graduated.
4. Ling Yao, M.S., Civil Engineering. Thesis title: “Shrinkage Mitigation Strategies for Internally Cured Alkali Activated Slag Mortars.” May 2015. Graduated.
5. Zilong Li, M.S., Civil Engineering. Thesis title: “Dynamics of Coupled Fluid-Object-Sediment Systems with Smoothed Particle Hydrodynamics (SPH) Simulations.” December 2019. Graduated.
6. Maitrey Patel, M.S., Civil Engineering, PSU Harrisburg. Thesis title “Micro-Computed-

Tomography Investigation of the Permeability of Silty Sands Compacted with Kaolinite or Illite.” May 2020. Graduated.

Awards received by graduate students at Penn State (with Xiao as major advisor)

1. Matthew Hallissey (Undergraduate student 2019-2023, and M.S. student 2023-2025)
 - Deep Foundations Institute, Penn State Scholarship Fund, awardee 2022
 - NSF Graduate Research Fellowship Program (GRFP) awardee 2023
2. Xiaohang Ji (PhD student):
 - At-Large Scholarships, Deep Foundations Institute (DFI) Charles J. Berkel Memorial Scholarship Fund, 2022
 - At-Large Scholarships, Deep Foundations Institute (DFI) Francis Gularte Civil Engineering Scholarship Fund, 2022
 - Leo P. Russell Graduate Fellowship in Civil Engineering, Department of Civil and Environmental Engineering, The Pennsylvania State University, 2022
3. Min Liew (MS then PhD student):
 - NSF Fellowship for Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering and Technology Conference, San Diego, California (hybrid mode), September 26–29, 2021. (National level)
 - James E. Marley Graduate Fellowship in Engineering, College of Engineering, The Pennsylvania State University, 2021 (College level)
 - Professional Development Grant, Women in Deep Foundations, Deep Foundations Institute Educational Trust, 2021 (National level)
 - Leo P. Russell Graduate Fellowship, Department of Civil and Environmental Engineering, The Pennsylvania State University, 2021 (Department level)
 - Grant Award for the National Conference for College Women Student Leaders (NCCWSL) by the American Association of University Women (AAUW) Pennsylvania, 2020 (National level)
 - Distinguished Master’s Thesis Award, Pennsylvania State University, 2018 (University level)
 - Mark E. and Claire L. Alpert Fellowship, Department of Civil and Environmental Engineering, Pennsylvania State University, 2020 (Department level).
 - ASCE Central Pennsylvania Section award, 2021 (Regional level).
4. Sajjad Salam (PhD student):
 - Harry G. Miller Fellowship in Engineering, Pennsylvania State University, 2020. (College Level)
 - Distinguished Graduate Fellowship, Pennsylvania State University, 2017. (University Level)
 - Mark E. and Claire L. Alpert Fellowship, Department of Civil and Environmental Engineering, Pennsylvania State University, 2019 (Department level).
 - Leo P. Russell Graduate Fellowship, Department of Civil and Environmental Engineering, Pennsylvania State University, 2019 (Department level).
 - International Association of Foundation Drilling (ADSC) Endowed Civil Engineering Award, 2019 (National Level)
 - Itasca Education Partnership, 2019 (National Level).
5. Jintai Wang (PhD student):
 - The Graduate Scholarship for Excellence in Engineering, Pennsylvania State University, 2018 (College level)

6. Behnoud Kermani (PhD student):
 - Harold F. Martin Graduate Assistant Outstanding Teaching Award, Pennsylvania State University, 2018 (University level).
 - Geosynthetic Institute (GSI) Fellowship award (2017) (National level).
 - Geosynthetic Institute (GSI) Fellowship award (2018) (National level).
 - International Association of Foundation Drilling (ADSC) Scholarship award, 2017 (National level).
 - Leo P. Russell Graduate Fellowship in Civil Engineering, Department of Civil and Environmental Engineering, Pennsylvania State University, 2016 (Department level).
7. Mahsa Khosrojerdi (PhD student):
 - Max and Joan Schlienger Graduate Scholarship in Engineering, College of Engineering, Pennsylvania State University, 2018 (College level).
 - International Association of Foundation Drilling (ADSC) scholarship award, 2017 (National level).
 - Leo P. Russell Graduate Fellowship in Civil Engineering, Department of Civil and Environmental Engineering, Pennsylvania State University, 2017 (Department level).
 - Second place, for paper presentation in College of Engineering Research Symposium (CERS), Penn State, 2017 (College level)
8. Benjamin Adams (PhD student):
 - ASCE Central Pennsylvania Section award, 2014 (Regional level).

TEACHING

Teaching at Penn State (2013-2023)

Undergraduate courses:

- CE 335 Engineering Mechanics of Soils
- CE 337 Civil Engineering Materials Laboratory
- CE 434 Geotechnical Engineering Design
- CE 435 Foundation Engineering

Graduate courses:

- CE 597-1 Geoenvironmental Engineering (new course)
- CE 597-2 Advanced Experimental Methods in Geotechnical Engineering (new course)
- CE 597-3 Geotechnical and Materials Engineering Seminar
- CE 597-4 Cold Regions Engineering (new course)

Teaching at CSU Fresno (2005-2013)

Undergraduate courses:

- CE 85 Introduction to Civil Engineering (1 time)
- CE 123 Soil Mechanics (15 times)
- CE 123L Soil Mechanics Lab (10 times)
- CE 125 Geotechnical Engineering Design (6 times)
- CE 134 Foundation Design (3 times)
- CE 180B Senior Project Design (Geotechnical design advisor) (per semester)

Graduate courses:

- CE 223 Advanced Soil Mechanics (3 times)
- CE 225 Numerical Methods in Geotechnical Engineering (3 times)
- CE 245 Geoenvironmental Engineering (4 times)
- CE291T Sustainability of Infrastructure and Resources (1 time)

SERVICES

Organizational Leaderships

- President, U.S. Permafrost Association (USPA) (2024)
- Member, Board of Directors, USPA (2023 – present)
- Chair, Permafrost Engineering Education Program (PEEP), USPA (2022 – 2023)
- Chair, ASCE Geo-Institute Technical Committee on Geotechnics of Soil Erosion (2011–2017)
- Member, Research Advisory Board, NSF Navigating the New Arctic (NNA) Community Office, 2021–2024.
- Member, Membership Committee, Arctic Research Consortium of the U.S. (ARCUS) (2022)
- Founding Board Member, International Association of Chinese Infrastructure Professionals (IACIP) (2011–2014)

Institutional Leaderships

- Incoming Chair, Graduate Research Committee, Graduate Council, Penn State (2023-2025)
- Director, Civil Infrastructure Testing and Evaluation Lab (CITEL), CEE Department, Penn State (2018 – 2022)
- Chair, Teaching Excellence Committee, CEE Department, Penn State (Fall 2021; Fall 2022 to Spring 2023)
- Chair, Geotechnical Faculty Search Committee, CEE Department (2021–2022)
- Chair, University Graduate Curriculum Subcommittee, CSU Fresno (2010–2013)
- President, Asian Faculty and Staff Association, CSU Fresno (2010–2011)
- President, Chinese American Faculty Association, CSU Fresno (2008–2009)
- Faculty Senator, Academic Senate of California State University (CSU), Fresno. (2005–2010)

Leadership Training and Credentials

- Certificate of Completion, Academic Leadership Academy, 2021 cohort, Pennsylvania State University.
- Penn State Emerging Academic Leaders Program (PSEAL), Fall 2023
- Certificate of Completion, Leadership Education for Asian Pacifics (LEAP) (2007)

Journal Editorial Board Services

- Associate Editor, *ASCE Journal of Geotechnical and Geoenvironmental Engineering* (since 2020).
- Associate Editor, *ASCE Journal of Cold Regions Engineering* (since 2023).
- Editorial Board Member, *Canadian Geotechnical Journal* (since 2018).
- Editorial Board Member, *ASTM Journal of Testing and Evaluation* (2014 to 2018).

Conference Organizers

As Conference Chairs:

- Chair, 10th International Conference on Scour and Erosion (ICSE-10), Virtual, Oct 17-20, 2021.
- Co-Chair, 4th GeoShanghai International Conference, Shanghai, China, May 27 to 30, 2018.
- Chair (lead organizer), 2018 Workshop on Permafrost Coastal Erosion–Research Coordination Network (PCE-RCN), October 11-12, 2018, University of Alaska Fairbanks.

- Chair (lead organizer), 2023 Arctic Coasts Workshop, to be held in University of Colorado, Boulder, October 9-11, 2023.

As Conference Session Chairs:

- Primary convener, 2023 AGU Fall Meeting. Session: Cold Regions and Arctic Civil Infrastructure: Case Studies, Innovations, and Challenges.
- Primary convener, 2023 AGU Fall Meeting. Session: Cold Regions STEM Education: Experiences, Practices, and Challenges
- Session chair: Panel: Practical Seepage Analysis on Embankment, Dams, and Slopes, 2020 GeoCongress.
- Session co-convener: Arctic Coastal Hazards and Risks. AGU Fall 2019 Meeting.
- Session co-chair: Bio-Geotechnical Stabilization of Slopes (with Don Gray), GeoFrontier 2017.
- Session co-chair: Use of Polymeric Fibers in Enhancing the Performance of Geotechnical Infrastructure. 2015 Geosynthetics International Conference.
- Session co-chair: Soil Erosion and Sustainability. Geo-Congress 2014.
- Session co-chair: Geosynthetic reinforced soil-integrated bridge system (GRS-IBS). Geosynthetics International Conference 2013.
- Session co-chair: Erosion and Slope Stability: Fundamental Research, Case Histories, and Remediation. Geo-Congress 2013.
- Session co-chair: Erosion and Scour. Geo-Congress 2012.
- Session Chair: Seepage and Drainage in Porous Media. The 1st GeoShanghai International Conference, Shanghai, China, June 2006.

Other conference organizing duties:

- Member, National Scientific Committee (NSC) for the 9th International Conference on Scour and Erosion (ICSE-9), Taipei, Taiwan, Nov 2018.
- Member, National Scientific Committee (NSC) for the 8th International Conference on Scour and Erosion (ICSE-8), Oxford, UK, Sept 2016.
- Member, National Scientific Committee (NSC) for the 5th International Conference on Scour and Erosion (ICSE-5), San Francisco, Nov 2010.

Professional Membership and Services

- Member, American Association for the Advancement of Science (AAAS) (2022 to present)
- Fellow, American Society of Civil Engineers (ASCE) (2020.1 to present)
- Diplomate, Geotechnical Engineering (D.GE), Academy of Geo-Professionals, ASCE (2020.6 to present)
- Lifetime Member, United States Permafrost Association (USPA) (2020.10 to present)
- Member, Arctic Research Consortium of the United States (ARCUS) (2019 to present)
- Member, American Society of Civil Engineers (ASCE) (2005 to 2019)
- Member, Frozen Ground Committee, ASCE's Cold Regions Engineering Division (2020.10 to present)
- Member (2009–present) and Secretary (2009–2013), ASCE G-I Technical Committee on Embankments, Dams, and Slopes
- Member (4/15/2012 – present) and Committee Research Coordinator (01/2014 – 01/2015), TRB Committee on Physicochemical and Biological Processes in Soils (AFP40). The

committee changed to TRB AKG30 Committee on Geo-Environmental and Climatic Impacts on Geomaterials in 2020.

- Member, American Society of Engineering Education (Aug 2013 – July 2014)
- Member, International Society of Soil Mechanics and Geotechnical Engineering
- Member, USUCGER
- Member, Consortium of Universities for Research in Earthquake Engineering (CUREE) (2014 to 2016)
- Member, Tau Beta Pi National Engineering Honor Society
- Member, Chi Epsilon National Civil Engineering Honor Society

Institutional Services at Penn State

- Chair, Graduate Research Committee, Graduate Council (2023-2024)
- Distinguished Honors Faculty of the Schreyer Honors College (2018-2020)
- Member representing College of Engineering, Graduate Council (2022-2025)
- Member, Advisory Committee, CEE Department (2019-2020)
- Member, Safety Committee, CEE Department (2018 to 2023)
- Member, Climate and Event Committee, CEE Department (2013 to 2014)
- Member, Teaching Excellence Committee, CEE Department (2017 to 2018)
- Member, Faculty Search Committees, CEE Department (2014 to 2020, 5 times)
- Member, Undergraduate Curriculum Committee, CEE Department (2016 to 2018)

Institutional Services at Fresno State

- Faculty Advisor, ASCE Student Chapter, CSU Fresno (01/2007–08/2010)
- Faculty Advisor, Chi Epsilon National Civil Engineering Honor Society Student Chapter, CSU Fresno (05/2008–08/2010)
- Member, faculty search committee for faculty positions in structural engineering (2006–2007), geomatics engineering (2007–2008), water resources (2008–2009), water resources (2011–2012), transportation engineering (2012–2013) at CSU Fresno.

Served as Technical Reviewers:

- Nature Reviews
- Nature Scientific Reports
- Environmental Research Letters
- Ambio
- Panelist, NCHRP project 24-43 “Relationship between Erodibility and Properties of Soils”
- Panelist, National Science Foundation
- ASCE Journal of Geotechnical and Geoenvironmental Engineering
- ASCE Journal of Materials in Civil Engineering
- ASCE International Journal of Geomechanics
- ASCE Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management
- ASTM Geotechnical Testing Journal
- ASTM Journal of Testing and Evaluation
- Soil Dynamics and Earthquake Engineering
- Geotechnical and Geological Engineering
- International Journal for Numerical and Analytical Methods in Geomechanics
- Ocean Engineering

- Transactions of ASABE
- ASABE Applied Engineering in Agriculture
- Current Nanoscience
- Geosynthetics International Journal
- Geotextiles and Geomembranes
- Computers and Geotechnics
- Fifth International Conference on Scour and Erosion (ICSE-5)
- Tenth International Conference on Scour and Erosion (ICSE-10)
- Geosynthetics 2013
- GeoShanghai 2006
- GeoShanghai 2010
- GeoShanghai 2014
- GeoHunan 2009
- GeoCongress 2008
- GeoCongress 2009
- GeoCongress 2010
- GeoCongress 2011
- GeoCongress 2012
- GeoCongress 2013
- GeoCongress 2014

Awards

- Penn State Engineering Alumni Society (PSEAS) Outstanding Teaching Award, College of Engineering, Pennsylvania State University, 2019
- Harry West Teaching Award, Department of Civil and Environmental Engineering, Pennsylvania State University, 2019
- Distinguished Honors Faculty of the Schreyer Honors College, Pennsylvania State University, 2018-2020.
- NSF Travel Fellowship, International Workshop on Multiscale and Multiphysics Processes in Geomechanics, Stanford University, June 23-25, 2010.
- The 2009 Claude C. Laval Jr. Award for Innovative Technology and Research: “Effects of Seismicity on Erosion and Strength of Levees.” California State University, Fresno.
- Graduate Faculty Enhancement Award, CSU Fresno, 2008.
- Certificate of Recognition for Achievements in Teaching, Scholarship, and Creative Activities, at 2008 Faculty Convocation, CSU Fresno, 2008.
- Faculty Advisor Award and Professor of the Year, ASCE Student Chapter at CSU Fresno, 2008.