Xiong Zhang, Ph.D., P.E.

Department of Civil, Architectural and Environmental Engineering, Missouri University of Science and Technology, 135 Butler-Carlton Hall, 1401 N Pine St., Rolla, MO 65409-0030
Email: zhangxi@mst.edu; Phone: 573-341-6286

ACADEMIC EXPERIENCE

- Ph.D., Civil Engineering (Geotechnical Engineering), Texas A&M University (TAMU), 2004
  Dissertation title: *Consolidation Theories for Saturated-Unsaturated Soils and Numerical Simulation of Residential Buildings on Expansive Soils*, Advisor: Jean-Louis Briaud
- M. S., Civil Engineering (Geotechnical Engineering), China Institute of Water Resources and Hydropower Research (IWHR), Beijing, China, 1995
  Thesis title: *Study on Filter of Broadly-Graded Soils Used as Anti-Seepage Material of Core Wall in High Earth-Rock Dam*, Advisor: Jie Liu
- B. S., Civil Engineering(Geotechnical Engineering), Tongji University, Shanghai, China, 1992

WORK EXPERIENCE

- September 2016 ~ present: Associate Professor, Department of Civil, Architectural and Environmental Engineering, Missouri University of Science and Technology (MST).
- January 2016 ~ August 2016: Associate Professor, Department of Civil Engineering, and Architectural Engineering, and Construction Management, University of Cincinnati (UC).
- July 2011 ~ January 2016: Associate Professor, Department of Civil and Environmental Engineering, University of Alaska Fairbanks (UAF).
- February ~ March 2014: Visiting Professor, Department of Civil, Environmental, and Architectural Engineering, University of Kansas.
- December 2013 ~ February 2014: Visiting Professor, Zachry Department of Civil Engineering, TAMU.
- September ~ December 2013: Visiting Professor, Department of Geotechnical Engineering and Geosciences, Technical University of Catalunya, Barcelona, Spain (Host: Eduardo Alonso).
- August 2006 ~ July 2011: Assistant Professor, Department of Civil and Environmental Engineering, UAF.
- October 2005 ~ August 2006: Research Associate IV, Louisiana Transportation Research Center (LTRC), Baton Rouge, Louisiana.
- September 2004 ~ October 2005: Postdoctoral Research Associate, Zachry Department of Civil Engineering, TAMU.
- September 2003 ~ September 2004: Graduate Teaching Assistant, Zachry Department of Civil Engineering, TAMU.
- September 2000 ~ September 2004: Graduate Research Assistant, Zachry Department of Civil Engineering, TAMU.
- May 1995 ~ September 2000: Geotechnical Engineer, Department of Geotechnical Engineering, IWHR, China.
- September 1992 ~ May 1995: Graduate Research Assistant, Department of Geotechnical Engineering, IWHR, China.

ACCREDITATION

Registered Professional Civil Engineer (State of Alaska, AELC 12465)

HONORS/AWARDS

- Outstanding Contribution Award, 2018 GeoShanghai International Conference, Shanghai, China
- Certificate of Invited Speaker, International Conference on Transportation Infrastructure and Materials 2017
- International Award for Innovation in Unsaturated Soil Mechanics, Technical Committee on Unsaturated Soils (TC106) within the International Society for Soil Mechanics and Geotechnical Engineering, 2016
- Certificate of Honor, Transportation Research Congress 2016
- Excellent reviewer, Canadian Geotechnical Journal, 2015
- Innovation Seed Award, UAF, 2011
- Innovative Technology Award, UAF, 2009
- ASCE ExCEEd Fellow, 2009
- Honorary Faculty, Department of Athletics, UAF, 2006
- Travel Award, Institution of Northern Engineering, UAF, 2006-2014
- Faculty Development Award, UAF, 2006
- Buchanan Research Assistantship, TAMU, 2000-2003
- Academic Excellence Scholarship, TAMU, 2000
- Outstanding Engineer, IWHR, Beijing, China, 1996-1998

RESEARCH INTERESTS

- Advanced Testing Techniques for Geo-material Characterization
- Modeling of Coupled Hydro-Chemo-Thermo-Mechanical Behavior of Geo-materials
- Numerical Methods and Modeling
- Remote Sensing for Geotechnical Applications
- Geothermal and Ground Source Heat Pump Systems
- Soil Structure Interaction
- Foundation on Expansive and Collapsible Soils
- Slope Stability and Retaining Walls
- Soil Stabilization and Ground Improvement
- Geotechnical Applications in Pavement Engineering
- Frost Heave and Thaw Weakening
- Frozen Ground Engineering

RESEARCH PROJECTS

Funded Projects (31 projects, total 4.45 million, my share 3.28 million, * are projects during the reporting period, 2.85 million, my expenditure during the reporting period, 1.41 million)

G1. Co- Principal Investigator (Co-PI) (30%), "Impact of Fines Content on Resilient Modulus Reduction of Base Courses during Thawing." USDOT RITA and AKDOT&PF, $150,000; 08/2007-07/2009.

G2. Principal Investigator (PI) (100%), "Investigation of Frost Heave Using Advanced Unsaturated Soil Mechanics Concept." Innovative Technology Award, UAF Technology Advisory Board, $ 22,332, 09/2008-06/2009.

G3. PI (100%), "Use of Mirafi Nylon Wicking Fabric to Help Prevent Frost Heaving in Alaska Pavements." Tencate Geosynthetics, Georgia, $91,574; 09/2008-08/2010.

G4. PI (100%), "Use of Shallow Anchors and Anchored Mesh System for Cut Slope Protection in Ice-Rich Soils." USDOT Research and Innovative Technology Administration (RITA)

and Alaska Department of Transportation & Public Facilities (AKDOT&PF), $300,000; 08/2008-07/2014.

G5. PI (100%), "A Simple Method to Determine Yield Surface for Saturated Chengde Sand." China Institute of Water Resources & Hydropower Research (IWHR), Beijing, China, 50,000CNY (equivalent to $8,143); 09/2009-08/2011.

G6. *PI (100%), "EAGER: Use of Results from the Undrain Triaxial Tests to Model Elasto-plastic Behavior for Unsaturated soils: A Feasibility Study." National Science Foundation, $48,958; 09/2010-12/2012.

G7. *PI (100%), "Fast Determination of Soil Behavior in the Capillary Zone Using Simple Laboratory Tests." USDOT RITA and TAMU, $286,984; 07/2010-12/2013.

G8. *PI (100%), "Use of Mirafi Nylon Wicking Fabric to Prevent Frost Boils in the Dalton Highway Beaver Slide Area, Alaska." USDOT RITA, AKDOT&PF, and TenCate Geosynthetics, $106,959; 07/2010-6/2013.

G9. *Co-PI (90%), "Stabilization of Erodible and Thawing Permafrost Slopes with Geofibers and Synthetic Fluid." USDOT RITA and AKDOT&PF, $236,176; 06/2010-12/2011.

G10. *Co-PI (50%), "Financial Impact of Fines in the Unbound Pavement Layers." USDOT RITA and AKDOT&PF, $150,000; 08/2011-12/2012.

G11. *PI (100%), "Supplemental to Use of Mirafi Nylon Wicking Fabric to Prevent Frost Boils in the Dalton Highway Beaver Slide Area, Alaska." UAF and USDOT RITA, $30,000; 08/2011-12/2012.

G12. *PI (100%), "Development of a Non-contact Method to Measure Volume Change for Unsaturated Triaxial Test." UAF Innovation Seed Award, $10,000; 07/2012-06/2013.

G13. *Co-PI (50%), "Rapid Determination of Unsaturated Moisture Diffusivity for Soils during the Frost Heave." USDOT RITA and Oklahoma State University, $200,000; 08/2011-12/2013.

G14. *PI (100%), "Experimental Study of Various Techniques to Protect Ice-Rich Cut Slopes." TransCanada Gas Pipeline, Alaska DOT&PF, and USDOT RITA, $480,000; 08/2011-06/2014.

G15. *PI (100%), "Monitoring Performance of Permafrost Cut Slope Protection Methods." AKDOT&PF, $36,581; 07/2013-12/2014.

G16. *Co-PI (50%), "Evaluate Presawn Transverse Thermal Cracks for Asphalt Concrete Pavement." AKDOT&PF and PacTrans, $100,000; 07/2013-06/2015.

G17. *Co-PI (50%), "Performance of G4 Fabric-Reinforced Asphalt Pavements in Alaska", TenCate Geosynthetics (North America), $130,540, 05/2012-12/2014.

G18. *PI (100%), "Development of Design Method for H2Ri Wicking Fabric in Pavement Structures." Tencate Geosynthetics, Georgia, $64,309; 09/2013-12/2016.

G19. *Co-PI (50%), "Evaluate H2Ri Wicking Fabric for Airport Pavement Applications." PacTrans Region 10 University Transportation Center &AKDOT&PF, $150, 450; 07/2013-6/2015.

G20. *PI (100%), "Monitoring Long-term Performance of H2Ri Wicking Fabric in the Test Section at the Dalton Highway Beaver Slide." TenCate Geosynthetics, Georgia, $29,900; 05/2013-05/2016.

G21. *PI (100%), "Laboratory Evaluation of Stress-Strain Behavior of Soils at the Riley Creek Bridge, Denali National Park, Alaska." AKDOT&PF, $22,353; 05/2014-07/2014.

G22. *PI (100%), "A Bio-Wicking System to Prevent Frost Heave in Alaskan Pavements." Tier 1 Center for Environmentally Sustainable Transportation in Cold Climates (CESTiCC) and Tencate Geosynthetics, $90,000, 09/2014-08/2019.

G23. *PI (100%), "Development of a Landslide Early-warning System." CESTiCC and University of Hawaii Manoa, $120,000, 09/2015-12/2019.

G24. *PI (100%), "Software Development for Soil Volume Measurements during Triaxial Testing." CESTiCC and University of Alaska Fairbanks, $105,000, 09/2015-12/2019.
G25. *PI (100%), "Extended Monitoring Long-term Performance of H2Ri Wicking Fabric in the Test Section at the Dalton Highway Beaver Slide." TenCate Geosynthetics, Georgia, $130,550, 04/2016-10/2022.
G26. *PI (100%), "A Bio-Wicking System to Prevent Frost Heave in Alaskan Pavements-Phase II: Implementation." CESTiCC and Tencate Geosynthetics, $225,000, 09/2017-12/2019.
G27. *PI (100%), "Numerical simulation of performance of road embankment installed with wicking fabric." Advanced Materials for Sustainable Infrastructure Signature Area Award (AMSI-BIC), Center for Infrastructure Engineering Studies, MST, $15,732, 06/01/2017-05/31/2018.
G28. *PI (100%), "Use of Wicking Fabric to Remove Capillary Water in Road Embankment-A Numerical Study." Geosynthetic Institute, $5,000, 08/21/2017-05/11/2018.
G29. *Co-PI (13.6%), "The Missouri Transect: Climate, Plants and Communities." National Science Foundation, $1,251,378 to Missouri S&T, my credit: 13.6%, $170,250, 09/19/2016-07/31/2019.
G30. *PI (100%), "A Photogrammetric Method to Measure 3D Full Field Displacement of Geosynthetic during the Tensile Test." Geosynthetic Institute, $5,000, 08/21/2018-05/11/2019.
G31. *PI (100%), "Feasibility Study on a Photogrammetry-Based Method to Continuously Measure 3D Full-Field Deformation of Unsaturated Soil Specimens during Triaxial Testing." Rock Mechanics & Explosives Research Center (RMERC) Seed Funding, Missouri S&T, $5,516, 08/1/2018-12/31/2018.
G32. *Co-PI (21%), "Preparing Interdisciplinary Professional for Rebuilding/Engineering Resilient Infrastructure of the Nation." U.S. Department of Education $746,250; 08/2019-07/2022.
G33. *PI (100%), "Use of H2Ri to Mitigate Pumping Issue at the Shoulder of Concrete Pavements." Missouri Department of Transportation, $35,753; 10/2018-12/2019.

COURSE TAUGHT

Undergraduate Courses

- ES 201 Computer Techniques (UAF)
- ES 209 Statics (UAF)
- ES 301 Engineering Analysis (UAF)
- CE 326 Introduction to Geotechnical Engineering (UAF)
- CE 422 Foundation Design (UAF)
- CVE3002C Introduction to Geotechnical Engineering (UC)
- CE3715 Fundamentals Geotechnical Engineering

Graduate Courses

- CE 625 Soil Stabilization and Ground Improvement (UAF)
- CE 628 Unsaturated Soil Mechanics (UAF)
- CE693 Special Topics on Unsaturated Soils (UAF)
- CE6716 Soil Stabilization (MST)
- CE6001 Special Topics on Unsaturated Soil Mechanics (MST)

Graduate Students Supervision

- Chuang Lin, PhD, Expected to graduate in May 2019 (MST)
- Xiaolong Xia, PhD, Expected to graduate in January 2020 (MST)
- Beshoy Riad, PhD, Expected to graduate in May 2011 (MST)
- Jianhua Yin, PhD, Expected to graduate in May 2022 (MST)
- Hanli Wu (Co-advised with Dr. Jenny Liu), PhD, Expected to graduate in May 2022 (MST)
- Javad Galinmoghadam, PhD, Expected to graduate in August 2022 (MST)
- Lin Li, PhD (09-2010-05/2015) (UAF)
  Dissertation Title: "Evaluation of Unsaturated Soil Behavior Using Constant Water Content Triaxial Tests."
  Current Job Status: Professor, Nanjing University of Forestry.
- Lin Li, MS (08/2008-08/2010, Graduated) (UAF)
  Thesis Title: "Impact of Fines Content on Resilient Modulus Reduction of Base Courses during Thawing."
  Current Job Status: Professor, Nanjing University of Forestry.
- Chuang Lin, MS, (01/2011-12/2014, Graduated) (UAF)
  Thesis Title: "Performance of Grouted Shallow Anchor in Ice-rich Permafrost."
  Current Job Status: PhD Student at MST
- Liangbiao Chen, MS, (08/2008-12/2010, Graduated) (UAF)
  Thesis Title: "Laboratory Testing of Grouted Shallow Anchor in Ice-rich Soils."
  Current Job Status: Research Associate at the Lamar University, Beaumont, Texas.
- Wendy Presler, MS, (08/2011-12/2015, Graduated) (UAF)
  Thesis Title: "Long-term Performance of H2Ri Wicking Fabric in Alaskan Pavements."
  Current Job Status: Geotechnical Engineer at Shannon & Wilson, Inc., Fairbanks, Alaska.
- Nicholas Belmont, MS, (08/2008-01/2010, unfinished) (UAF)
  Project: "Use of Mirafi Nylon Wicking Fabric to Help Prevent Frost Heaving in Alaska Pavements."
  Current Job Status: Fairbanks North Star Borough School District, Fairbanks, Alaska

Postdoctoral Fellows and Visiting Scholars

- Dr. Lin Li, Postdoctoral Fellow, 05/2015-07/2017 (UAF)
- Dr. Zhaotian Zeng, 12/2014-12/2015, Visiting Scholar at UAF from Guilin University of Technology, China (UAF)
- Dr. Rongtao Yan, 12/2014-12/2015, Visiting Scholar at UAF from Guilin University of Technology, China (UAF)
- Dr. Zibing Wang, 12/2014-12/2015, Visiting Scholar at UAF from Guilin University of Technology, China (UAF)
- Dr. Chunmei Mu, 07/2016-06/2017, Visiting Scholar at MST from Guilin University of Technology, China (MST)
- Mr. Yipeng Guo, 06/2017-12/2018, Visiting Scholar at MST from Central South University, China (MST)
- Ms. Shanmei Li, 11/2017-10/2018, Visiting Scholar at MST from Guilin University of Technology, China (MST)
- Mr. Donggen Chen, 10/2017-09/2018, Visiting Scholar at MST from State Key Laboratory of Road Engineering Safety and Health in Cold and High-Altitude Regions, CCCC First Highway Consultants Co., LTD, Xi'an, China (MST)
- Dr. Xiaojun Liu, 06/2018-05/2019, Visiting Scholar at MST from Xi'an University of Architecture, Xi'an, China (MST)

Graduate Student Awards (while under my advising)

- Lin Li, International Innovation Award in Unsaturated Soil Mechanics, ISSMGE, 2016
- Lin Li, Doctoral Dissertation Fellowship, University of Alaska Fairbanks, 2013-2014
- Lin Li, AUTC Travel Award, 2014
- Lin Li, Mendenhall Travel Award, 2014
- Chuang Lin, 2017 IACIP Outstanding Graduate Student Award, Washington D.C., 2018
- Chuang Lin, Shannon & Wilson, Inc. – Richard Frueh Memorial Scholarship in Geotechnical Engineering, $4000, MST, 2018
- Chuang Lin, Shannon & Wilson, Inc. – Richard Frueh Memorial Scholarship in Geotechnical Engineering, $2000, MST, 2017
- Chuang Lin, Geosynthetic Institute (GSI) Fellowships, $5000, 2017-2018
- Chuang Lin, MST/MODOT Transportation Infrastructure Conference Poster Competition, 2nd Place, MST, 2016
- Chuang Lin, AUTC Travel Award, UAF, 2014
- Chuang Lin, Mendenhall Travel Award, UAF, 2014
- Xiaolong Xia, GSI Fellowships, $5000, 2018-2019
- Xiaolong Xia, Geo-Confluence Research Scholarship, $2000, ASCE Geo-Institute St. Louis Chapter, 2017
- Xiaolong Xia, Norbert Schmidt Fellowship, $800, MST, 2017
- Beshoy Riad, The Mark A. Harms Fellowship, MST, 2017

Short Courses, Workshops, and Webinars

- ASCE GI Workshop on Shrink-well Soils, 2004
- ASCE Webinar: Introduction to Constitutive Modeling of Unsaturated Soils, 2011
- CESTiCC Webinar: Use of Wicking Fabric to Dehydrate Road Embankment under Unsaturated Conditions, 2014
- Workshop on Use of Wicking Fabric to Dehydrate Road Embankment to Tencate Geosynthetics, 2014
- CESTiCC Summer Transportation Institute, 2015
- Rapid Characterization and Modelling of Unsaturated Soils, PanAm-UNSAT, Dallas, TX, 2017
- Short Course on Unsaturated Soil Mechanics, Hunan University, December 2017, China
- Use of Mirafi Nylon Wicking Fabric to Prevent Frost Boils in Alaskan Pavements, TRB workshop on Best Practices for Pavement Design Using Geosynthetics, Washington DC, January 2018

PROFESSIONAL AFFILIATIONS

- Editorial Board Member, Canadian Geotechnical Journal
- Editorial Board Member, Geomechanics and Engineering, An International Journal (GAE)
- Vice-Chair, ASCE Geo-Institute Shallow Foundation Committee
- Voting Member, TC106 Unsaturated Soils, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)
- Committee Member, ASCE Geo-Institute Committee on Design of Residential Structures on Expansive Soil Standards
- Committee Member, ASCE Geo-Institute Pavement Committee
- Committee Member, ASCE Geo-Institute Unsaturated Soil Mechanics Committee

- Chair, ASCE Live Webinar Subcommittee Member, ASCE Geo-Institute Unsaturated Soil Mechanics Committee
- Committee Member, TRB AFP60 Committee on Engineering Behavior of Unsaturated Soils
- Committee Member, TRB AFP50 Committee on Seasonal Climatic Effects on Transportation Infrastructure
- Committee Member, TRB AFS20 Committee on Soil and Rock Instrumentation
- Member, American Society of Civil Engineers
- Member, International Society of Soil Mechanics and Foundation Engineering
- Member, American Society of Engineering Education
- Member, Chi Epsilon
- Board Member, International Association of Chinese Infrastructure Professionals
- Chair, Strategic Planning Committee, International Association of Chinese Infrastructure Professionals

SERVICES

Conference Organizer

- Technical Committee Chair, 4th GeoShanghai International Conference, May 27-30, 2018, Shanghai, China
- Secretary General, International Symposium on Systematic Approaches to Environmental Sustainability in Transportation, August 2-5, 2015, Fairbanks, AK, USA
- Secretary General, 3rd GeoShanghai International Conference, May 24-27, 2014, Shanghai, China
- Technical Committee Chair, International Symposium of Climatic Effects on Pavement and Geotechnical Infrastructure, August 4-7, 2013, Fairbanks, AK, USA

Conference Session Organizer

- "Innovations in Geotechnical Engineering- A Symposium in Honor of Professor Jean-Louis Briaud." International Foundations Congress and Equipment Expo, March 5-10, 2018, Orlando, Florida
- "Shallow Foundations." International Foundations Congress and Equipment Expo, March 5-10, 2018, Orlando, Florida
- "Coupled Processes in Unsaturated Soils Related to Geothermal Energy Applications." Geo-Chicago 2016, August 14-18, Chicago, IL.
- "Soil and Rock Behavior and Laboratory Testing." Geo-Frontiers 2011, March 13-16, Dallas, Texas.
- "Physical, Numerical, Constitutive Modeling of Soil Behavior." GeoHunan International Conference II: Emerging Technologies for Design, Construction, Rehabilitation, and Inspections of Transportation Infrastructures. June 6~8, 2011, Hunan, China.
- "Advances in Experimental, Computational, and Applied Unsaturated Soil Mechanics." GeoShanghai 2010 International Conference, June 3-5, 2010, Shanghai, China.
- "Advances in Unsaturated Soil, Seepage, and Environmental Geotechnics." GeoHunan, August 3-6, 2009, Hunan, China.
- "Climatic Factors Influencing Pavement Infrastructure." GeoCongress, New Orleans, LA March 9-12, 2008.

Conference Session Moderator

- 7th International Conference on Unsaturated Soils, 3rd - 5th August, 2018, Hongkong
- International Symposium on Systematic Approaches to Environmental Sustainability in Transportation, August 2-5, 2015, Fairbanks, Alaska, USA.
- GeoShanghai International Conference 2014, May 24-27, 2014, Shanghai, China.
- GeoHunan International Conference I, August 3-6, 208, Hunan, China.
- Geo-Frontiers 2011, March 13-16, Dallas, Texas.
- 2009 International Symposium on Unsaturated Soil Mechanics and Deep Geological Disposal of Nuclear Waste, Shanghai, China.
- GeoCongress, New Orleans, LA March 9-12, 2008.
- 4th International Conference on Unsaturated Soils, Carefree, AZ, April 2006.
- 1st International Conference on Scour of Foundations, College Station, TX, November 2002.

Paper reviewer for journals

- ASCE Journal of Geotechnical and Geoenvironmental Engineering
- ASCE International Journal of Geomechanics
- ASCE Journal of Engineering Mechanics
- ASCE Journal of Materials in Civil Engineering
- ASCE Journal of Cold Regions Engineering
- Geotechnique
- Canadian Geotechnical Journal
- Engineering Geology
- Acta Geotechnica
- ASTM Geotechnical Testing Journal
- Journal of Geotechnical and Geological Engineering
- Computers and Geotechnics
- Applied Clay Science
- Cold Regions Science and Technology
- Transportation Research Board Annual meeting
- Composites Part B: Engineering
- Transpiration Geotechnics
- Journal of Cleaner Production
- International Journal of Physical Sciences
- 4th International Conference on Unsaturated Soils
- Ninth International Permafrost Conference 2008
- GeoCongress 2008-2014, GeoHunan 2009 &2011
- 2006, 2010, 2014 GeoShanghai International Conference
- Transportation Research Record, 2006-2014

Proposal reviewer

- National Science Foundation
- Petroleum Research Fund, American Chemical Society
- PacTrans Region 10 University Transportation Center, USDOT
- Mountain-Plains Consortium Regional University Transportation Center, USDOT
- Center for Environmentally Sustainable Transportation in Cold Climates, USDOT

University and Public Services

At UAF

- UAF Faculty Senate, 2010-2014
- Graduate Academic & Advisory Committee, UAF
- Computer Advisory Board, College of Engineering and Mines, UAF
- Webmaster, Department of Civil and Environmental Engineering, UAF
- Graduate Admission Review Committee, Dept. of Civil and Environmental Engineering, UAF
- Faculty Advisor, Chinese Students Association at UAF
- Faculty Advisor, Chi Epsilon Chapter at UAF
- Organizer, Engineering Open House, 2012-2014
- Outside Examiner, Ph.D. Oral Comprehensive Exam, UAF, 2008-2014
- Judge, Alaska Statewide High School Science Symposium, 2011

At Missouri S&T

- Departmental Representative, Information Technology/Computing (ITCC), 2017-2020
- Member, Geological Faculty Search Committee, Missouri S&T
- Chair, Geotechnical Faculty Search Committee, Missouri S&T
- Geotechnical Group Coordinator, CArEE, Missouri S&T
- Chair, Wen Deng's Mentoring Committee, CArEE, Missouri S&T
- Member, Wen Deng's 3rd Year Review Panel, CArEE, Missouri S&T
- Committee member, Labs Oversight & Safety, CArEE, Missouri S&T
- Committee member, Distance Education Certificates, CArEE, Missouri S&T
- Committee member, CE Undergraduate Program Committee, CArEE, Missouri S&T

PUBLICATIONS (Students names are underlined, * corresponding author)

Book Edited

B1. **Zhang**, **X.*,** Cosintino, P., and Hussein, M. (2018). "***Innovations in Foundations Engineering.***" ASCE Geo-Institute Geotechnical Special Publication.

B2. Zhao, S., Liu, J.*, and **Zhang**, **X.** (2015). ***Innovative Materials and Design for Sustainable Transportation Infrastructure.*** ASCE Construction Institute Special Publication.

B3. **Zhang, X.***, Chu, J., and Bulut, R. (2014). ***Soil Behavior and Geomechanics***, ASCE Geo-Institute Geotechnical Special Publication 236.

B4. Liu, J.*, Li, P., **Zhang**, **X.,** and Huang, B. (2014). ***Climatic Effects on Pavement and Geotechnical Infrastructure.*** ASCE Construction Institute Special Publication.

B5. **Zhang, X.***, Yu, X., Fu, H., and Zhang, J. (2009). ***Characterization, Modeling, and Performance of Geomaterials.*** ASCE Geo-Institute Geotechnical Special Publication No.189***.***

B6. Hoyos, L. *, **Zhang, X.**, and Puppala, A. (2009). ***Experimental and Applied Modeling of Unsaturated Soils.*** ASCE Geo-Institute Geotechnical Special Publication No.202.

Peer-Reviewed Journal Publications

J1. Li, L.*. and **Zhang, X.** (2018). "A New Approach to Measure Shrinkage Curves of Cohesive Soils." ***ASTM Geotechnical Testing Journal.*** (Accepted)

J2. Li, L.*, **Zhang, X**., and Li, P. (2018). "Evaluating a New Method for Simultaneous Measurement of Soil Water Retention and Shrinkage Curves." ***Acta Geotechnica***. (Accepted).

J3. Lin, C., **Zhang, X.*,** and Han, J. (2018) "Comprehensive Material Characterizations for a Road Embankment Installed with Wicking Fabric". ***ASCE Journal of Materials in Civil Engineering.*** (Accepted)

J4. Guo, Y., Leng, W., Nie, R.*, Zhao, C., and **Zhang, X.** (2018). "Laboratory Evaluation of a New Device for Water Drainage in Roadside Slope along Railway System." ***Geotextiles and Geomembranes.*** (Accepted).

J5. Lin, C., and **Zhang, X.*** (2018) "Laboratory Evaluation of Drainage Performance of a Wicking Geotextile". ***ASCE Journal of Materials in Civil Engineering.*** (In Press)

J6. **Zhang, X**.*, Li, L., and McHattie, R. (2018). "An Experimental Study on Various Techniques to Protect Ice-Rich Cut Slope." ***ASCE Journal of Cold Region Engineering,*** 32(1), March 2018.

J7. Lin, C., and **Zhang, X.*** (2018) "A Bio-Wicking System to Dehydrate Road Embankment". ***Journal of Cleaner Production***. 196, 902-915.

J8. Li, L.* and **Zhang, X**. (2018). "Factors Influencing the Accuracy of a Photogrammetry-based Method." ***Acta Geotechnica***. https://link.springer.com/article/10.1007/s11440-018-0663-4

J9. Liu, H., Lu, H.*, **Zhang, X.,** Li, J., and Wang, W. (2018), "An Experimental Study on Cement-Solidified Cd-Contaminated Soils under Drying-Wetting Cycles," ***Journal of Testing and Evaluation***, Volume 46, Issue 2 (March 2018) https://doi.org/10.1520/JTE20160613. ISSN 0090-3973.

J10. Liu, J.*, **Zhang, X.,** Li, L. and Saboundjian, S. (2017). "Resilient Behavior of Unbound Granular Materials Subjected to a Closed-System Freeze-Thaw Cycle", ***ASCE Journal of Cold Regions Engineering***, 32(1), 04017015.

J11. Lin, C., Presler, W., **Zhang X.*,** Jones, D. and Odgers, B. (2017). "Long-term Performance of H2Ri Wicking Fabric in Alaskan Pavements." ***ASCE Journal of Journal of Performance of Constructed Facilities***. Vol. 31, Issue 2.

J12. Zeng, Z., **Zhang X.*,** Zhao, Y., and Lu, H. (2017). "Experimental Study on the Performance of a Ground Source Heat Pump System and the Heat-Moisture Migration of Surrounding Soils in Karst Areas." ***ASCE Journal of Journal of Performance of Constructed Facilities***. Volume 31 Issue 5 - October 2017

J13. Liu, J.*, **Zhang, X**., Li, L., and Saboundjian, S. (2017). "Resilient Behavior of Unbound Granular Materials Subjected to a Closed-System Freeze-Thaw Cycle." ***ASCE Journal of Cold Region Engineering***. 32(1): 04017015, http://ascelibrary.org/doi/abs/10.1061/%28ASCE%29CR.1943-5495.0000142.

J14. Wang, F., Han, J.*, **Zhang, X.**, and Guo, J. (2017). "Laboratory Test to Evaluate Effectiveness of Wicking Fabric in Soil Moisture Reduction." ***Geotextiles and Geomembranes,*** 45 (2017) 8-13. http://dx.doi.org/10.1016/j.geotexmem.2016.08.002

J15. Yang, J., Lu, H.*, **Zhang, X.,** Li, J. and Wang, W.(2017). "An Experimental Study on Solidifying Municipal Sewage Sludge through Skeleton Building using Cement and Coal Gangue." ***Advances in Materials Science and Engineering***. Article ID 5069581, 13 pages, doi.org/10.1155/2017/5069581.

J16. Briaud, J. L. *, Abdelmalak, R., **Zhang, X.**, and Mango, B. (2016). "Stiffened Slab on Grade on Shrink-Swell Soil: New Design Method." ***ASCE Journal of Geotechnical and Geoenvironmental Engineering,*** DOI: 10.1061/(ASCE)GT.1943-5606.0001460.

J17. Guo, J., Wang, F., **Zhang, X.,** and Han, J. * (2016). "Quantifying Water Removal Rate of a Wicking Geotextile under Controlled Temperature and Relative Humidity." ***ASCE***

Journal of Materials in Civil Engineering, DOI: 10.1061/(ASCE)MT.1943-5533.0001703.

J18. Lu, H. *, Zhang, Q., Dong, Y., Li, J. and **Zhang, X.** (2016). "The Adsorption Capacity, Pore Structure, and Thermal Behavior of the Modified Clay Containing SSA." ***Advances in Materials Science and Engineering***, Volume 2016, Article ID 9894657.

J19. **Zhang, X.** * (2016). "Limitations of the suction controlled tests in the characterization of constitutive behavior of unsaturated soils." ***International Journal for Numerical and Analytical Methods in Geomechanics,*** 40:269–296. (DOI: 10.1002/nag.2401).

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C2. **Zhang, X.*** and Li, L. (2015). "Experimental Study of Total and Localized Volume Changes of Unsaturated Fairbanks Silts under Undrained Loadings." ***International Foundations Congress and Equipment Expo 2015 (IFCEE 2015)***, San Antonio, TX.

C3. Liu, J.*, McHattie, R., Zhao, S., and **Zhang**, **X.** (2015) "Field Evaluation of Precut Thermal Cracks in an AC Pavement in Alaska", ***ASCE Construction Institute Special Publication on Environmental Sustainability in Transportation Infrastructure***, Edited by Liu et al., 95-103, 2015.

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C19. **Zhang, X. *** and Lytton, R. L. (2007). "Use of State Surface Approach to Explain the Barcelona Basic Model." ***Theoretical and Numerical Unsaturated Soil Mechanics***, Springer Proceedings in Physics 113, Volume 113, 2007, pp 101-107.

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C23. Wu, H., Liu, J.*, and **Zhang, X**. "Numerical Analysis for the Cooling Performance of a Novel Air Convection Embankment in Permafrost Regions", International Airfield and Highway Pavement Conference 2019, Chicago, July 2019 (abstract submitted).

C24. Fayek, S., Liu, J.*, and **Zhang, X.** "Influence and Characteristically Evaluation of Base Materials Conditions on Pavement Performance at Different Traffic Loadings and Climate Conditions", International Airfield and Highway Pavement Conference 2019, Chicago, July 2019 (abstract submitted).

C25. Li, L., and **Zhang, X. *** (2018). "Deformation and Suction Variation of an Unsaturated Soil during Constant Water Content Triaxial Loading." The 7th international conference on unsaturated soils, Hong Kong.

C26. Li, L., **Zhang, X. ***, and Li, P., (2018). "Soil Water Retention Surface Determination Using a New Triaxial Testing System." GeoShanghai International Conference 2018, Shanghai, P.R. China.

C27. Xia, X. and **Zhang, X. *** (2018) "Accurate Automatic Detection of Coded Targets for Rapid Deformation Measurement in Triaxial Tests on Unsaturated Soil Specimens". The 7th International Conference on Unsaturated Soils. August, 2018, Hong Kong, China.

C28. Xia, X., Luo, W., Yin, Z., **Zhang, X. *** (2018) "Fully Automated and Accurate 3D Reconstruction of Unsaturated Soil Specimens." The 7th International Conference on Unsaturated Soils. August, 2018, Hong Kong, China.

C29. Lin, C., and **Zhang, X. *** "Wicking Fabric Interactions with Different Soil Types", UNSAT2018 – the 7th International Conference on Unsaturated Soils, Aug 3-5, 2018, Hongkong, China.

C30. Lin, C., and **Zhang, X. *** "Numerical Simulation of Moisture Migration for a Flexible Pavement Installed with Wicking Fabric." GeoShanghai International Conference, May 27-30, 2018, Shanghai, China.

C31. Lin, C., and **Zhang, X. *** (2017). "A Bio-Wicking System to Dehydrate Road Embankment under Unsaturated Conditions." 2017 International Conference on Transportation Infrastructure and Materials, June 9-12, 2017, Qingdao, China.

C32. Li, L. and **Zhang, X. *** (2015). "Deformation Non-uniformity of an Unsaturated Soil during Triaxial Testing." International Foundations Congress and Equipment Expo 2015. pp. 2084-2091. doi: 10.1061/9780784479087.192.

C33. **Zhang, X. *** (2015). "Failure of Divide-and-Conquer Approach in the Characterization of Unsaturated Soils." ***6th Asia-Pacific Conference on Unsaturated Soils,*** October23-26, 2015, Guilin, China.

C34. **Zhang, X. *** (2015). "Problems Associated with Determination of Yield Curves for Unsaturated Soils." ***6th Asia-Pacific Conference on Unsaturated Soils,*** October23-26, 2015, Guilin, China.

C35. Han, J. and **Zhang, X. *** (2014). "Keynote Lecture: Recent Advances in the Use of Geosynthetics to Enhance Sustainability of Roadways." ***International Conference on Advances in Civil Engineering for Sustainable Development***, Suranaree University of Technology, Nakhon Ratchasima, Thailand, 27-29 August 2014, pp 29-39.

C36. Li, L., Saboundjian, S., Liu, J., and **Zhang, X**. ***** (2013). "Permanent Deformation Behavior of Alaskan Granular Base Materials." ***10th International Symposium on Cold Regions Development (ISCORD 2013)***, edited by Jon E. Zufelt, June 2-5, 2013, Anchorage, AK. pp. 428-435.

C37. Briaud, J. L., Abdelmalak, R., and **Zhang, X. *** (2010). "Design of Stiffened Slabs-On-Grade on Shrink-Swell Soils." **Opening Keynote Lecture** at the ***5th International***

Conference on Unsaturated Soils, September 6-8, 2010, Barcelona, Spain, CRC Press-Balkema-Taylor and Francis Group.

C38. **Zhang, X. *** (2010). "Use of Results from Undrained Tests for the Constitutive Modeling of Unsaturated Soils." ***5th International Conference on Unsaturated Soils***, September 6-8, 2010, Barcelona, Spain.

C39. **Zhang, X. * (2010).** "Three Dimensional Numerical Simulation of a Residential Building on Expansive Soil Subject to a Leaking Underground." ***5th International Conference on Unsaturated Soils***, September 6-8, 2010, Barcelona, Spain.

C40. **Zhang, X. *** (2009). "Some Problems in the Constitutive Modeling of Unsaturated Soils." ***Proceeding of International Symposium on Unsaturated Soil Mechanics and Deep Geological Disposal of Nuclear Waste (UNSAT-WASTE 2009)***, August 24-28, 2009, Shanghai, China. pp. 224-228.

C41. **Zhang X. *** and Liu, J. (2008). "A New Method to Determine the Shapes of Yield Curves for Unsaturated Soils." ***87th Transportation Research Board Annual Meeting***, Washington, D.C., January 2008.

C42. **Zhang X. ***and Briaud, J. L. (2008). "A Total Stress-Pore Water Pressure Formulation of Coupled Consolidation Analysis for Saturated Soils." ***87th Transportation Research Board Annual Meeting***, Washington, D.C., January 2008.

C43. **Zhang, X. *** and Lytton, R. L. (2007). "Use of State Surface Approach to Explain Unsaturated Expansive Soil Behavior." ***International Conference on Advanced Characterization of Pavement and Soil Engineering Materials***, Athens, Greece, June 2007.

C44. **Zhang, X. ***and Briaud, J. L. (2007). "Slab moment distributions of a residential building." ***3rd Asian Conference on Unsaturated Soils***, (UNSAT-ASIA 2007) Nanjing, China, April 2007.

C45. **Zhang, X. *** and Lytton, R. L. (2007). "One Dimensional Consolidation for an Unsaturated Collapsible Soil." Presented at ***85th Transportation Research Board Annual Meeting***, Washington, D.C., January 2006.

C46. **Zhang, X. *** and Briaud, J. L. (2007). "Coupled Water Content Method for Shrink and Swell Predictions." Presented at the ***85th Transportation Research Board Annual Meeting***, Washington, D.C., January 2006.

C47. **Zhang, X. ***, Lytton, R. L., and Briaud, J. L. (2005). "Coupled Consolidation Theory For Saturated-Unsaturated Soils." ***Third Biot Conference on Poromechanics (Biot Centennial)***, University of Oklahoma, Norman, Oklahoma, USA, 2005, edited by Abousleiman et al. pp.323-330.

Conference Paper under Review

C48. Lin, C., and **Zhang, X. *** (2019). "SEM Analyses on the Long-term Performance of H2Ri Wicking Geotextile." ***Geo-Congress 2019***, March 24-27, 2019, Philadelphia, PA, USA. (Under review).

C49. Lin, C., and **Zhang, X. *** (2019). "Numerical Investigation of a Saturated and Unsaturated Soil-Atmosphere Model." ***Geo-Congress 2019***, March 24-27, 2019, Philadelphia, PA, USA. (Under review).

C50. Guo, Y., Leng, W., **Zhang, X. ***, and Lin, C. (2019). "Primarily Study on Drainage Performances of Two Geosynthetics." ***Geo-Congress 2019***, (Under review).

C51. Riad, B. and **Zhang, X. *** "Analysis of the oedometer test results using a new method." ***Geo-Congress 2019***, March 24-27, 2019, Philadelphia, PA, USA. (Under review).

C52. Li, S., Liu, Z., **Zhang, X. ***, and Mu, C. (2018). "Effect of Acid Rain on the Disintegration of Remolding Red Clay." ***Geo-Congress 2019***, March 24-27, 2019, Philadelphia, PA, USA. (Under review).

C53. Xia, X., **Zhang, X. *,** and Yin, Z. (2019) "A Photogrammetric Computer Vision Approach to Determining the Camera Poses for Unsaturated Soil Deformation Measurement." The 7th Asian Pacific Conference on Unsaturated Soils. August, 2019, Tokyo, Japan (abstract submitted)

Selected Technical Reports

R1. Lin, C. and **Zhang, X. *** (2016). "A Bio-Wicking System to Mitigate Capillary Water in Base Course." ***Research Report*** to Center for Environmentally Sustainable Transportation in Cold Climates, UAF, AK.

R2. Liu, J., McHattie, R., **Zhang, X. ***, and Netardus, J. (2015), "Evaluation of Precut Transverse Cracks for an Asphalt Concrete Pavement in Interior Alaska (Moose Creek – Richardson Highway)", INE/AUTC Report, UAF, AK, 2015, https://trid.trb.org/view.aspx?id=1372572.

R3. Lin, C., **Zhang, X*.,** and Han, J. (2015). "Development of a Design Method for H2Ri Wicking Fabric in Pavement Structures." ***Research Report*** to TenCate Geosynthetics

R4. Lin, C., Li, L., and **Zhang, X. *** (2014). "Laboratory Tests on Soils at the Riley Creek, Denali, Alaska." ***Research Report*** to AKDOT&PF, UAF, AK.

R5. Liu, J. *, **Zhang, X.**, Chamberlain, A., and Li, L. (2014). "Financial Impact of Fines in the Unbound Pavement Layers." ***Research Report*** to AUTC/AKDOT&PF, UAF, AK.

R6. **Zhang, X. *,** Hulsey, L**.,** Connor, B., Zhang, M., Collins, R., and Li, L. (2014). "Stabilization of Erodible Slopes with Geofibers and Nontraditional Liquid Additives." ***Research Report*** to AUTC/AKDOT&PF, UAF, AK.

R7. Li, L., **Zhang, X. ***, Zhang, M., and McHattie, R. (2014). "Experimental Study of Various Techniques to Protect Ice-Rich Cut Slopes." ***Research Report*** to AUTC/AKDOT&PF, UAF, AK.

R8. Li, L., **Zhang, X. *,** and Lytton, L. (2014). "Fast Determination of Soil Behavior in the Capillary Zone." ***Research Report*** to AUTC/AKDOT&PF, UAF, AK.

R9. Lin, C., Chen, L., **Zhang, X. ***, and McHattie, R. (2013). "Creep Behavior of Shallow Anchors in Ice-Rich Permafrost." AUTC/AKDOT&PF Research Report, UAF, AK.

R10. **Zhang, X. *** and Presler, W. (2013). "Use of H2Ri Wicking Fabric to Prevent Frost Boils in the Dalton Highway Beaver Slide Area, Alaska." ***Research Report*** to TenCate Geosynthetics, AUTC/AKDOT&PF, UAF, AK.

R11. **Zhang, X. *** and Belmont, N. (2009). "Use of Mirafi Nylon Wicking Fabric to Help Prevent Frost Heaving in Alaska Pavement: 1st, 2nd, 3rd, 4th and 5th progress reports." ***Research Reports*** to TENCATE GEOSYNTHETICS (North America).

R12. Li, L., Liu, J. *, and **Zhang, X.** (2010). "Impact of Fines Content on Resilient Modulus Reduction of Base Courses during Thawing." ***Research Report*** to AUTC/AKDOT&PF, UAF, AK.

R13. **Zhang, X. *** and Zhang, J. (1998). "Ground Treatment of No.5-8 generating units of Hongyanchi Thermal Power Station, Xingjiang Uygur Autonomous Region." ***Research Report***, China Institute of Water Resources & Hydropower Research (in Chinese).

R14. **Zhang, X. *** and Ding, L. (1997). "Seepage Treatment of Eastern Ridge of Shiba River Tailing Dam -Site Investigation, 3-D FEM Seepage and Slope Stability Analysis, and Treatment." ***Research Report***, China Institute of Water Resources & Hydropower Research (in Chinese).

R15. **Zhang, X.** *, Zhang, J. and Zheng, Y. (1996). "Grout Stabilizing of No.2 Flood Discharge Tunnel of Shiba River Tailing Reservoir, Zhongtiaoshan Non-ferrous Metals Co., China Nonferrous Metals International Mining Co Ltd (CNMC)." China Institute of Water Resources & Hydropower Research (in Chinese).

R16. **Zhang, X.** * (1995). "Investigation of Permeability and Filter Design of Broadly-Graded Soils." A General Report on Key Technology Problems of High Earth-Rock Dam, Chapter 4, Page 118-130, China Institute of Water Resources & Hydropower Research(in Chinese).

SELECTED INVITED TALKS (Since 2017)

P1. **Zhang, X.**, "Use of Wicking Fabric to Mitigate Frost Heave in Cold Regions Pavements." **Opening Keynote Lecture** at the ***TRANSOILCOLD 2019 Transportation Soil Engineering in Cold Regions,*** 20 –23 May, 2019, St. Petersburg, Russia (to be delivered)

P2. **Zhang, X.**, "Rapid Characterization of Stress-Strain Behavior for Unsaturated Soils using Simple Equipment." **Opening Keynote Lecture** at the ***7th Asia-Pacific Conference on Unsaturated Soils,*** August 23~25, 2019, Nagoya Japan (to be delivered)

P3. **Zhang, X.**, "Deformation and suction variation of an unsaturated soil during constant water content triaxial loading." *7th International Conference on Unsaturated Soils***,** 3rd - 5th August, 2018, Hongkong.

P4. **Zhang, X.**, "Wicking fabric interactions with different soil types." *7th International Conference on Unsaturated Soils,* 3rd - 5th August, 2018, Hongkong.

P5. **Zhang, X.**, "Automatic detection of coded targets for rapid measurement of volume changes of unsaturated soil specimens in triaxial tests." *7th International Conference on Unsaturated Soils,* 3rd - 5th August, 2018, Hongkong.

P6. **Zhang, X.**, "A fully automated and accurate method for 3D reconstruction of unsaturated soil specimens." *7th International Conference on Unsaturated Soils***,** 3rd - 5th August, 2018, Hongkong.

P7. **Zhang, X.**, "Limitations of Divide & Conquer Approach in Unsaturated Soil Characterization." *Tongji University, 6*th August, 2018, Shanghai, China.

P8. **Zhang, X.**, "Use of Wicking Fabric to Dehydrate Road Pavements under Unsaturated Conditions." Presented to the ACSE GI St. Louis Chapter "Case Histories Seminar and Student Projects", March 2017, St. Charles, MO

P9. **Zhang, X.**, "Limitations of Suction-Controlled Triaxial Tests for Unsaturated Soil Characterization," St. Louis Geo-Structures Confluence 2017, November 2017.

P10. **Zhang, X.**, "Challenges in the Unsaturated Soil Research and Possible Solutions", Invited Lecture, 2017 *International Conference on Transportation Infrastructure and Materials*, June 9-12, Qingdao, China

P11. **Zhang, X.**, "Use of Wicking Fabric to Prevent Frost Boils in Alaskan Pavements", ASCE Congress on Technical Advancement, Duluth, MN, September 2017.

P12. **Zhang, X.**, "Rational Selection of the Model Parameters in the Barcelona Basic Model", Invited Lecture, Transportation Research Congress 2017, Beijing, China, May 2017.

P13. **Zhang, X.**, "Limitations of Suction-Controlled Triaxial Tests for Unsaturated Soil Characterization." IACIP 2018 Annual Meeting.

P14. **Zhang, X.**, "Use of Wicking Fabric to Prevent Frost Heave in Alaskan Pavements." TRB workshop on Best Practices for Pavement Design Using Geosynthetics, January 2018, 2018 TRB Annual Meeting.

P15. **Zhang, X.**, "Use of Wicking Fabric to Dehydrate Road Pavements for Better Performance." Presented to the AFS 60 TRB Subsurface Drainage Committee, 2018 TRB Annual Meeting

P16. **Zhang, X.**, "Rapid Characterization of Unsaturated soils." Presented to the AFP60 Engineering Behavior of Unsaturated Geomaterials Committee, Jan 10; 2018 TRB Annual Meeting

P17. **Zhang, X.**, "Rapid Characterization of Unsaturated soils." Presented to the AFP60 Engineering Behavior of Unsaturated Geomaterials Committee, Jan 10; 2018 TRB Annual Meeting

P18. **Zhang, X.**, "Rapid Characterization of Unsaturated soils." Presented to the TRB AFS20 Committee on Soil and Rock Instrumentation, 2018 TRB Annual Meeting

P19. **Zhang, X.**, "Numerical Simulation of Seasonal Variations of Base-Course Resilient Modulus on Pavement Structure." Presented to the AFP60 Engineering Behavior of Unsaturated Geomaterials Committee, Jan 10; 2018 TRB Annual Meeting (Poster)