Xijun SHI, Ph.D., P.E.

Assistant Professor, Ingram School of Engineering, Texas State University

5208 RF Mitte, 601 University Drive, San Marcos, Texas, 78666, xijun.shi@txstate.edu

Web Google Scholar ResearchGate

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BIOGRAPHY

Dr. Xijun Shi, P.E., is an Assistant Professor of civil engineering at Texas State University (TXST), USA. He received his PhD and MS degrees in Civil Engineering, both from Texas A&M University (TAMU). He graduated from the "Mao Yisheng" Honors Undergraduate Pavement Engineering Program at Southeast University in China. After his PhD study, Shi worked as an Assistant Research Scientist/Postdoc at the Center for Infrastructure Renewal (CIR) of Texas A&M University and a Postdoc at the Texas A&M Transportation Institute (TTI). Shi is passionate about advancing sustainable, multifunctional infrastructure assets. His primary research interests lie in the areas of infrastructure materials and pavement engineering. Since joining Texas State University in Fall 2020, Shi has won 14 internal and external projects as PI funded by NSF, NASA, ACI Foundation, etc. At TAMU, Shi participated in several research projects on materials and pavements funded by NSF, DOTs, FHWA, etc. Shi has more than 40 peer-reviewed publications and was lead author of 20 of the papers published in prestigious journals such as Cement and Concrete Research, Cement and Concrete Composites, Engineering Fracture Mechanics, etc. Shi serves on several professional organizations, including American Concrete Institute (ACI), Transportation Research Board (TRB), and American Society of Civil Engineers (ASCE). Notably, Shi is a main member of TRB AKP 20 Standing Committee on Design and Rehabilitation of Concrete Pavements and a voting member of ACI 555 Concrete with Recycled Materials and ACI 565 Lunar Concrete. Shi chairs ACI 555-A and co-chairs Concrete Pavements Committee of World Transport Convention (WTC). Shi also serves on the editorial board for several international journals. In addition, Shi recently filed a patent about a sustainable, cost-effective cementitious material (called Plient Concrete) and won the 2021 TXST New Ventures competition and an NSF I-Corps grant for commercialization. In 2022, Shi co-founded a startup company called Circle Concrete Tech Inc (https://buildwithcircle.com/), which is centered upon innovation, like Plient Concrete, that markedly reduces the tremendous environmental impacts of the concrete industry. Shi is a recipient of 2021 USDA E. Kika De La Garza Fellowship and a member of ACI Class of 2022 Emerging Leaders Alliance. In 2022, Shi guided the TXST CaerusCrete team to the first prize at the 2022 NASA MINDS Undergraduate Student Design competition with a lunar geopolymer project.

EDUCATION

Texas A&M University, College Station, Texas, United States 2018
Doctor of Philosophy in Civil Engineering (Materials and Pavements)
- Dissertation: Evaluation of Portland Cement Concrete Containing Reclaimed Asphalt Pavement for Pavement Applications

Texas A&M University, College Station, Texas, United States 2014
Master of Science in Civil Engineering (Materials and Pavements)
- Thesis: Controlling Thermal Properties of Asphalt Concrete and Its Multifunctional Applications

Southeast University, Nanjing, Jiangsu, China 2012
Bachelor of Engineering in Transportation Engineering (Highway and Bridge Engineering)
- Graduated from the "Mao Yisheng Class", an Honors Program (selected from top 10%)

APPOINTMENT

- **Assistant Professor**, Ingram School of Engineering, Texas State University — Sep. 2020 – present
- **Co-Founder and Chief Technology Officer,** Circle Concrete Tech, Inc — Mar. 2022 – present
- **Assistant Research Scientist**, Center for Infrastructure Renewal, Texas A&M University — May 2020 – Aug. 2020
- **Postdoctoral Researcher**, Center for Infrastructure Renewal, Texas A&M University — Jun. 2018 – Apr. 2020
- **Postdoctoral Researcher**, Texas A&M Transportation Institute, Texas A&M University — Feb. 2018 – Jan. 2019
- **Graduate Research Assistant**, Texas A&M Transportation Institute, Texas A&M University — Mar. 2013 – Jan. 2018

RESEARCH INTEREST

- Cementitious Materials Containing Recycled Aggregates
- Multifunctional Construction Materials for Smart Infrastructure
- Alternative Cements
- Pavement Design, Evaluation, and Life Cycle Assessment
- Sustainable, High Performance Fiber Reinforced Construction Materials
- Extraterrestrial Construction Materials

GRANTS & CONTRACTS

Awarded Projects at Texas State University (2020 - present), totaling $357,138 as PI, and $716,154 as Co-PI

- **NASA M-STTR: Lunar Concrete for Additive Manufacturing Using Locally Available Resources on the Moon,** *National Aeronautics and Space Administration*
  PI: **Shi, X;** Co-I: Collins, K., Sharma, A. $49,924, 2022 – 2023
- **Multiscale Reinforcement of Hybrid Steel Fiber Reinforced Concrete,** *American Concrete Institute Foundation*
  PI: **Shi, X;** Co-PI: Grasley, Z. $57,500, 2022 – 2023
- **NSF I-Corps: High-performance Cementitious Materials,** *National Science Foundation*
  PI: **Shi, X**; Co-PI: Grasley, Z. $50,000, 2021 – 2023
- **NASA MINDS: Further Testing of Lunar Geopolymer,** *National Aeronautics and Space Administration*
  PI: **Shi, X.** $2,500, 2022 – 2023
- **NASA MINDS: Geopolymer for Future Lunar 3D Printing Construction,** *National Aeronautics and Space Administration*
  PI: **Shi, X.** $5,500, 2021 – 2022
- **NASA MINDS: Alternative Materials for Lunar and Martian Construction,** *National Aeronautics and Space Administration*
  PI: **Shi, X.** $2,500, 2020 – 2021
- **Microstructural Analysis for Concrete,** *Wiss, Janney, Elstner Associates Inc*
  PI: **Shi, X.** $6,552, 2022 – 2023
- **Multidisciplinary Internal Research Grant Program: Utilization of Agricultural Wastes in Sustainable Concrete,** *Texas State University*
  PI: **Shi, X**; Co-PI: Drewery, M., Liu, X., Alkire, L. $29,980, 2022-2023
- **International Research Accelerator: Fostering Technology-enhanced Infrastructure Research with Panamanian Collaborators,** *Texas State University*
  PI: **Shi, X;** Co-PI: Torres, A. $30,000, 2022 – 2023
- **MARC Equipment Grant: Acquisition of a Flexural Fixture for Instron 5989 Test Instrument,** *Texas State University*
  PI: **Shi, X.** $59,848, 2022 – 2023
- **New Ventures 2021: Plient Concrete,** *Texas State University*
  PI: **Shi, X.** $20,000, 2021 – 2022
- **Multidisciplinary Internal Research Grant Program: Nondestructive Assessment of Additive Dispersion Quality in Conductive Concrete using Electromagnetic Waves,** *Texas State University*
  PI: **Shi, X**; Co-PI: Chen, M. $29,834, 2021-2022
- **Research Enhancement Program Project: Electrically Conductive Concrete by Adding Recycled Carbon Fibers,** *Texas State University*
  PI: **Shi, X.** $8,000, 2021 – 2022
- **TXST I-Corps: Plient: Super "Green", Highly Crack-resistant Cementitious Materials,** *Texas State University Site*
  PI: **Shi, X.** $8,000, 2021 – 2021
- **Acquisition of Wide Frequency Band Characterization System for Electronic Devices, Antennas, and Intelligent Materials**, *Department of Defense*
  PI: Chen, Y; Co-PI: Droopad, R; Stern, H., Stephen, K., Tate, J., Geerts, W., **Shi, X.** $548,700, 2022 – 2023
- **Professional Services and Studies on Green and Technology-Enhanced Infrastructure Management and Firefighter's Health**, *Hays County*
  PI: Chen, Y; Co-PI: Yeon, J., **Shi, X.,** Ozbakkaloglu, T., Kulesza, S., Carvallo, A. $167,454, 2023 – 2024

Additional Awarded Project Experience at Texas A&M University as Postdoc/PhD Student (2013-2020)

- **NSF ERC Planning Grant: Engineering Research Center for AI in Construction (AI-Con),** *National Science Foundation*
  One of the major proposal contributors (PI: Grasley, Z.) $100,000 awarded, 2019 – 2020
- **Concrete and Composites Experiments and Modeling for Army Applications,** *US Army Engineer Research and Development Center*
  Proposal contributor (PI: Grasley, Z.) $2.75M awarded, 2019 – 2024
- **Utilization of UHPC Bridge Superstructures in Texas,** *Texas Department of Transportation*
  Proposal contributor (PI: Hueste, M.) $1.28M awarded, 2018 – 2022
- **Recycling and Reuse of Materials in Transportation Projects,** *Oklahoma Department of Transportation*
  Proposal contributor (PI: Mukhopadhyay, A.) $20,000 awarded, 2016 – 2018

TEACHING

- **Instructor**, *CE 5340 Advanced Infrastructure Materials,* graduate level, Ingram School of Engineering, Texas State University 2022 – present
- **Instructor**, *CE 2340 Infrastructure Materials,* undergraduate level, Ingram School of Engineering, Texas State University 2021 – present
- **Alternative Instructor**, *CVEN 306 Materials Engineering for Civil Engineers,* undergraduate level, Zachry Department of Civil and Environmental Engineering, Texas A&M University Spring, 2020
- **Teaching Assistant**, *CVEN 653 Bituminous Materials*, undergraduate & graduate levels, Zachry Department of Civil Engineering, Texas A&M University Fall 2015, Fall 2016
- **CIRTL Associate-Fellow**, Center for Teaching Excellence, Texas A&M University 2018

PUBLICATIONS

Journal Articles (* denotes corresponding author)

- ***Shi, X.,** Baranikumar, A., and Grasley, Z. (2021) "Estimating viscoelastic compliance of desiccating cementitious materials using drying prism tests." *Cement and Concrete Research*, 147, 106522.
- ***Shi, X.,** Brescia, L., Tavares, C., and Grasley, Z. (2020) "Semicircular bending fracture test to evaluate fracture properties, ductility, and toughness of cement mortar reinforced by scrap tire recycled steel fiber." *Engineering Fracture Mechanics,* 236, 107228.
- ***Shi, X.,** Park, P., Rew, Y., Huang, K., and Sim, C. (2020). "Constitutive behaviors of steel fiber reinforced concrete under uniaxial tension and compression." *Construction and Building Materials,* 233, 117316.
- ***Shi, X.,** Brescia, L., Grasley, Z., and Hogancamp, J. (2020). "Fracture properties and restrained shrinkage cracking resistance of cement mortar reinforced by recycled steel fiber from scrap tires. " *Transportation Research Record: Journal of the Transportation Research Board,* 2674(8), 581-590.
- ***Shi, X.,** Grasley, Z., Hogancamp, J., Brescia, L., Mukhopadhyay, A., and Zollinger, D. (2020)" Microstructural, mechanical, and shrinkage characteristics of cement mortar containing fine reclaimed asphalt pavement. "*Journal of Materials in Civil Engineering*, 32(4), 04020050.
- ***Shi, X.,** Zollinger, D., and Mukhopadhyay, A. (2020). "Punchout study for continuously reinforced concrete pavement containing reclaimed asphalt pavement using pavement ME models." *International Journal of Pavement Engineering,* 21(10), 1199-1212.
- ***Shi, X.,** Mirsayar, M., Mukhopadhyay, A., and Zollinger, D. (2019) " Characterization of two-parameter fracture properties of portland cement concrete containing reclaimed asphalt pavement aggregates by semicircular bending specimens." *Cement and Concrete Composites*, 95, 56-69.
- ***Shi, X.,** Mukhopadhyay, A., Zollinger, D., and Grasley, Z. (2019) "Economic input-output life cycle assessment of concrete pavement containing recycled concrete aggregate." *Journal of Cleaner Production,* 225, 414-425.
- **Shi, X.,** Rew, Y., Ivers, E., Shon, C.-S., Stenger, E. M., and *Park, P. (2019). "Effects of thermally modified asphalt concrete on pavement temperature." *International Journal of Pavement Engineering,* 20(6), 669-681.
- **Shi, X.,** *Mukhopadhyay, A., and Zollinger, D. (2019). "Long-term performance evaluation of concrete pavements containing recycled concrete aggregate in Oklahoma." *Transportation Research Record: Journal of the Transportation Research Board,* 2673(5), 429-442.
- ***Shi, X.,** Mukhopadhyay, A., Zollinger, D., and Huang, K. (2019). "Performance evaluation of jointed plain concrete pavement made with portland cement concrete containing reclaimed asphalt pavement." *Road Materials and Pavement Design,* 1-23. DOI: 10.1080/14680629.2019.1616604.
- ***Shi, X.,** Mukhopadhyay, A., and Zollinger, D. (2018). "Sustainability assessment for portland cement concrete pavement containing reclaimed asphalt pavement aggregates." *Journal of Cleaner Production,* 192, 569-581.
- **Shi, X.,** *Mukhopadhyay, A., and Liu, K.-W. (2017). "Mix design formulation and evaluation of portland cement concrete paving mixtures containing reclaimed asphalt pavement." *Construction and Building Materials,* 152, 756-768.
- Chong, B. W., and ***Shi, X**. (2023). Meta-analysis on PET plastic as concrete aggregate using response surface methodology and regression analysis. *Journal of Infrastructure Preservation and Resilience*, 4(1), 1-15.
- Deng, Y., ***Shi, X.,** Kou, Y., Chen, J., Shi, Q. (2022) "Optimized design of asphalt concrete pavement containing phase change materials based on rutting performance." *Journal of Cleaner Production,* 134787.
- Deng, Y., ***Shi, X.,** Zhou, Y., and Chen, J. (2021). "Numerical modelling of rutting performance of asphalt concrete pavement containing phase change material." *Engineering with Computers*, https://doi.org/10.1007/s00366-021-01507-3.
- Deng, Y., ***Shi, X.,** *Yao, Z. (2021). "Determination of composite modulus of concrete containing reclaimed asphalt pavement using micromechanical modelling and soft computing techniques" *Journal of Cleaner Production*, 327. 129486.

- Hou, S., ***Shi, X.,** Deng, Y., and Gu, F. (2018). "Evaluation of rutting and friction resistance of hot mix asphalt concrete using an innovative vertically loaded wheel tester." *Construction and Building Materials,* 176, 710-719.
- Huang, K., ***Shi, X.,** Zollinger, D., Mirsayar, M., Wang, A., and Mo L. (2019). "Use of MgO expansion agent to compensate concrete shrinkage in jointed reinforced concrete pavement under high-altitude environmental conditions." *Construction and Building Materials,* 202, 528-536.
- Kuai, C., Chen, J., ***Shi, X.,** and Grasley, Z. (2021). "Regulating porous asphalt concrete temperature using PEG/SiO_2 phase change composite: experiment and simulation" *Construction and Building Materials,* 273, 122043.
- *Chen, J., Zhang, W., ***Shi, X.,** Yao, C., and Kuai, C. (2020). "Use of PEG/SiO_2 phase change composite to control porous asphalt concrete temperature." *Construction and Building Materials,* 245, 118459.
- *Sleiman, C., **Shi, X.,** and Zollinger, D. (2019). "An approach to characterize the wearability of concrete pavement surface treatments." *Transportation Research Record: Journal of the Transportation Research Board,* 2673(1), 230-239.
- *Mukhopadhyay, A., and **Shi, X.** (2019). "Microstructural characterization of portland cement concrete containing reclaimed asphalt pavement aggregates using conventional and advanced petrographic techniques." *Advances in Cement Analysis and Concrete Petrography, ASTM STP1613,* D. Cong and D. Broton, Eds., ASTM International, West Conshohocken, PA.
- Rew, Y., **Shi, X.,** Choi, K., and *Park, P. (2018). "Structural design and lifecycle assessment of heated pavement using conductive asphalt." *Journal of Infrastructure Systems,* 24(3), 04018019.
- *Mirsayar, M., **Shi, X.,** and Zollinger, D. (2017). "Evaluation of interfacial bond strength between Portland cement concrete and asphalt concrete layers using bi-material SCB test specimen." *Engineering Solid Mechanics,* 5(4), 293-306.
- *Mukhopadhyay, A., and **Shi, X.** (2019). "Utilization of reclaimed asphalt pavement aggregates in portland cement concrete for concrete pavement." *American Concrete Institute Special Publication,* 334, 13-32.
- *Huang, K., Zollinger, D., **Shi, X.,** and Sun, P. (2017). "A developed method of analyzing temperature and moisture profiles in rigid pavement slabs." *Construction and Building Materials,* 151, 782-788.
- *Liu, K-W., Mukhopadhyay, A., **Shi, X.,** and Hus, J-L. (2018). "Chemical approaches to prevent alkali-silica reaction in concrete- a review." *Engineering Solid Mechanics,* 6(3), 201-208.
- Zhang, Y., *Luo, X., Deng, Y., Hou, S., **Shi. X.,** and Lytton, R. (2020). "Evaluation of rutting potential of flexible pavement structures using energy-based pseudo variables." *Construction and Building Materials,* 247, 118391.
- Deng, Y., *Luo, X., Zhang, Y., Cai, S., Huang, K., **Shi, X.,** and Lytton, R. (2020). "Determination of flexible pavement deterioration conditions using LTPP database and artificial intelligence-based finite element model updating." *Structural Control and Health Monitoring,* 28(2), e2671.
- Deng, Y., *Zhang, Y., **Shi, X.,** Hou, S., and Lytton, R. (2021). " Stress–strain dependent rutting prediction models for multi-layer structures of asphalt mixtures." *International Journal of Pavement Engineering,* 23(8), 2728-2745.
- *Liu, Y., Qian, Z., **Shi, X.**, Zhang, Y., and Ren, H. (2021) "Developing cold-mixed epoxy resin-based ultra-thin antiskid surface layer for steel bridge deck pavement." *Construction and Building Materials,* 291, 123366.
- *Liu, Y., Qian, Z., Hu, H. **Shi, X.** and Chen, L. (2021) "Developing a skid resistance prediction model for newly built pavement: application to a case study of steel bridge deck pavement." *Road Materials and Pavement Design,* 23(10), 2334-2352.
- Hou, S., *Deng, Y., Jin, Rui., **Shi,** X., and Luo, X. (2022) "Relationships between physical, mechanical and acoustic properties of asphalt mixtures using ultrasonic testing." *Buildings*, 12(3), 306.
- Nodehi, M., *Ozbakkaloglu, T., Gholampour, A., Mohammed, T., and **Shi, X.** (2022). The effect of curing regimes on physico-mechanical, microstructural and durability properties of alkali-activated materials: A review. *Construction and Building Materials*, 321, 126335.
- Selvam, M., Debbarma, S., *Singh, S., and **Shi, X**. (2022). Utilization of alternative aggregates for roller compacted concrete pavements–A state-of-the-art review. *Construction and Building Materials*, 317, 125838.
- Saed, S. A., Karimi, H. R., Rad, S. M., *Aliha, M. R. M., **Shi, X.,** and Haghighatpour, P. J. (2022). Full range I/II fracture behavior of asphalt mixtures containing RAP and rejuvenating agent using two different 3-point bend type configurations. *Construction and Building Materials*, 314, 125590.
- *Chen, J., Sun, Z., Zhang, W., **Shi, X.,** and Yuan, J. (2022). Performance of anti-icing stone mastic asphalt: laboratory and field investigation. *International Journal of Pavement Engineering,* 1-10.
- Huang, K., Liu, J., *Wang, J., and **Shi, X**. (2021). Characterization and mechanism of a new superhydrophobic deicing coating used for road pavement. *Crystals*, 11(11), 1304.
- Chen, J., Zhao, C., *Liu, Q., **Shi, X.,** and Sun, Z. (2023). Investigation on frost heaving stress (FHS) of porous cement concrete exposed to freeze-thaw cycles. *Cold Regions Science and Technology*, 205, 103694.

Conference Papers

- **Shi, X.,** and Grasley, Z. (2020) "Determining fracture properties of the two-parameter fracture model using semi-circular bending fracture test for reclaimed asphalt pavement based cement mortar. " *Proc., Advances in Materials*

and Pavement Performance Prediction, San Antonio, Texas.

- **Shi, X.,** Mukhopadhyay, A, and Zollinger, D. (2020). "Evaluation of reclaimed asphalt pavement based portland cement concrete for pavement applications. " *Proc., 12th International Conference on Concrete Pavements,* Minneapolis, Minnesota, accepted.
- **Shi, X.,** Grasley, Z., Mukhopadhyay, and Zollinger, D. (2020). "Use of recycled aggregates in concrete pavement: pavement design and life cycle assessment." *Proc., International Symposium on Pavement, Roadway, and Bridge Life Cycle Assessment 2020*, Sacramento, California.
- **Shi, X.,** and Mukhopadhyay, A. (2018). "Use of reclaimed asphalt pavement aggregates in portland cement concrete for pavement application: a critical overview." *Proc., Transportation Research Board 97th Annual Meeting,* Washington D.C.
- **Shi, X.,** Rew, Y., Shon, C.-S., and Park, P. (2015). "Controlling thermal properties of asphalt concrete and their effects on pavement surface temperature." *Proc., Transportation Research Board 94th Annual Meeting,* Washington D.C.
- Chen, J., and **Shi, X.** (2021). "Utilization of PEG/SiO_2 phase change composite to regulate open-graded friction course temperature. " *Proc., International Symposium on Frontiers of Road and Airport Engineering 2021 Delft*, Online.
- Mirsayar, M., **Shi, X.,** and Zollinger, D. (2017). "Evaluation of interfacial bond strength between portland cement concrete and asphalt concrete layers using bimaterial semicircular bend test specimen. " *Proc., Transportation Research Board 96th Annual Meeting,* Washington D.C.
- Huang, K., Zollinger, D., **Shi, X.,** and Sun, P. (2016). "A developed method of analyzing temperature and moisture profiles in rigid pavement slabs." *Proc., 11th International Conference on Concrete Pavement,* San Antonio, Texas.
- Rew, Y., **Shi, X.,** and Park, P. (2015). "Graphite added heated pavement for deicing." *Proc., US-Korea conference*, Atlanta, Georgia.

Technical Reports

- Mukhopadhyay, A., **Shi, X.,** Zollinger D. (2018). "Recycling and reuse of materials in transportation projects—current status and potential opportunities including evaluation of RCA concrete pavements along an Oklahoma interstate highway." *FHWA-OK-18/04,* U.S. Dep. of Transportation, Oklahoma.
- Mukhopadhyay, A., and **Shi, X.** (2017). "Validation of RAP and/or RAS in hydraulic cement concrete: technical report." *FHWA/TX-17/0-6855-1,* U.S. Dep. of Transportation, Texas.
- Birely, A., Park, P., McMahon, J., **Shi, X.,** and Rew Y. (2018) "Fiber reinforced concrete for improved performance of transportation infrastructure." *FHWA/AZ-MPD 069-14,* U.S. Dep. of Transportation, Arizona.
- Park, P., Rew, Y., and **Shi, X.** (2014). "Pilot study on conductive paving materials using graphite." *Korea Institute of Civil Engineering and Building Technology*, Texas A&M Transportation Institute, College Station, Texas.

PRESENTATIONS & POSTERS

Presentations

- Chong. BW, **Shi, X.** " Meta-analysis on PET plastic as concrete aggregate using RSM and regression analysis." Transportation Research Board 102nd Annual Meeting, Washington D.C., 8-12 January 2023 ***(Lectern Session, PhD student Chong was the presenter).***
- **Shi, X.** "Utilization of Recycled Materials in Concrete to Promote Sustainability. " Transportation Research Board 102nd Annual Meeting, Washington D.C., 8-12 January 2023 (***Lectern Session Presenter***).
- **Shi, X.** "Utilization of Recycled Materials in Concrete to Promote Sustainability. " TriDurLE 2022 Annual Symposium, Honolulu, HI, 9-11 November 2022 ***(Lectern Session Presenter).***
- **Shi, X.,** and Nodehi, M. "Mechanical properties and cracking potential of portland cement based – and alkali-activated materials containing waste glass powder. " *American Concrete Institute 2022 Fall Convention*, online, 23-27 October 2022 (***Lectern Session Presenter***).
- **Shi, X.** "Semicircular bending fracture test for cementitious materials " *2022 Society of Engineering Science Annual Technical Meeting*, College Station, TX, 16-19 October 2022 ***(Lectern Session Presenter).***
- **Shi, X.,** and Grasley, Z. "Semicircular bending fracture test for cementitious materials " *12th Advances in Cement-Based Materials (ACerS annual meeting)*, Irvine, CA, 11-13 July 2022 ***(Lectern Session Presenter).***
- **Shi, X.**, and Grasley "Semicircular bending fracture test for cementitious materials." *The 5th International Symposium on Frontiers of Road and Airport Engineering*, online, 12-14 July 2021 (***Lectern Session Presenter***).
- Chen, J., and **Shi, X.** " Utilization of PEG/SiO2 Phase Change Composite to Regulate Open-graded Friction Course Temperature." *The 5th International Symposium on Frontiers of Road and Airport Engineering*, online, 12-14 July 2021 (***Lectern Session Presenter***).
- **Shi, X.,** Mukhopadhyay, A., and Zollinger, D. "Long-term performance evaluation of concrete pavements containing recycled concrete aggregate in Oklahoma." *ASCE International Airfield & Highway Pavements Conference*, online, 8-10 June 2021 (***Lectern Session Presenter***).

- **Shi, X.,** Grasley, Z., Mukhopadhyay, A., and Zollinger, D. "Use of recycled aggregates in concrete pavement: pavement design and life cycle assessment. "*LCA2020*, online, 12-15 January 2021 (***Lectern Session Presenter***).
- **Shi, X.,** Brescia, L., Grasley, Z., and Hogancamp, J. "Fracture properties and restrained shrinkage cracking resistance of cement mortar reinforced by recycled steel fiber from scrap tires. " *American Concrete Institute 2020 Fall Convention*, online, 25-29 October 2020 (***Lectern Session Presenter***).
- **Shi, X.,** and Grasley, Z. "Semicircular bending test to evaluate cementitious materials fracture properties. "*Advances in Materials and Pavement Performance Prediction,* Online, 03-07 August 2020 (***Lectern Session Presenter***).
- **Shi, X.,** Brescia, L., Grasley, Z., and Hogancamp, J. "Fracture properties and restrained shrinkage cracking resistance of cement mortar reinforced by recycled steel fiber from scrap tires. " *Transportation Research Board 99th Annual Meeting,* Washington D.C., 12-16 January 2020 (***Lectern Session Presenter***).
- **Shi, X.** "Evaluation of reclaimed asphalt pavement based cementitious materials." *The 10th International Association of Chinese Infrastructure Professionals Annual Workshop*, Washington D.C. 12 January 2020 (***Lectern Session Presenter***).
- **Shi, X.** "Evaluation of reclaimed asphalt pavement based cementitious materials." *American Concrete Institute 2019 Fall Convention,* Cincinnati, OH, 20-24 October 2019 (***Mini Session Presenter***).
- **Shi, X.** "Evaluation of portland cement concrete containing recycled aggregates." *Seminars Held at Five Different Chinese Universities, Including Southeast University, Hohai University, Nanjing Forestry University, Nanjing Tech University, and Jinan University,* Nanjing & Jinan, China, 19 March-26 March 2019 (***Seminar Speaker***).
- **Shi, X.** "Mix design formation and evaluation of portland cement mixtures containing reclaimed asphalt pavement." *International Workshop on 3D Printing Technology & Materials Design for Intelligent Infrastructure,* Beijing, China, 10 March 2019 (***Lectern Session Presenter***).
- **Shi, X.,** Mukhopadhyay, A., and Zollinger, D. "Long-term performance evaluation of concrete pavements containing recycled concrete aggregate in Oklahoma." *Transportation Research Board 98th Annual Meeting,* Washington D.C. 13-17 January 2019 (***Lectern Session Presenter***).
- **Shi, X.,** and Mukhopadhyay, A. "Use of reclaimed asphalt pavement aggregates in portland cement concrete for pavement application: a critical overview." *Transportation Research Board 97th Annual Meeting,* Washington D.C. 07-11 January 2018 (***Lectern Session Presenter***).
- **Shi, X.,** Mukhopadhyay, A., and Liu, K-W. "Mechanical characteristics of concrete containing RAP as coarse aggregate replacement for pavement application." *Transportation Research Board 96th Annual Meeting,* Washington D.C. 08-12 January 2017 (***Lectern Session Presenter***).

Posters

- Aduwenye, P., **Shi. X.** " Electrically conductive concrete by adding recycled carbon fibers " *2022 Society of Engineering Science Annual Technical Meeting*, College Station, TX, 16-19 October 2022.
- Ghadami, M., **Shi. X.,** McLean, R. "Application of microbially induced calcium carbonate precipitation in bio mortar. " *2022 Society of Engineering Science Annual Technical Meeting*, College Station, TX, 16-19 October 2022.
- **Shi, X.,** Grasley, Z., Mukhopadhyay, A., and Zollinger, D. "Evaluation of Reclaimed Asphalt Pavement Based Cementitious Materials." *Gordon Research Conference & Gordon Research Seminar: Advanced Materials for Sustainable Infrastructure Development 2020,* Venture, California, 22 February- 28 February 2020.
- **Shi, X.,** Mukhopadhyay, A., and Zollinger, D. " Use of reclaimed asphalt pavement aggregates in portland cement concrete: a feasibility study for pavement applications." *The 8th IACIP Annual Workshop,* Washington D.C. 7 January 2018
- **Shi, X.,** and Mukhopadhyay, A. "Use of reclaimed asphalt pavement aggregates in portland cement concrete: a feasibility study for pavement applications." *2017 Oklahoma Transportation Research Day,* Oklahoma City, Oklahoma. 17 October 2017
- **Shi, X.,** Rew, Y., Shon, C.-S., and Park, P. "Controlling thermal properties of asphalt concrete and their effects on pavement surface temperature." *Transportation Research Board 94th Annual Meeting,* Washington D.C. 11-15 January 2015.
- Mirsayar, M., **Shi, X.,** and Zollinger, D. (2017). "Evaluation of Interfacial Bond Strength between Portland Cement Concrete and Asphalt Concrete Layers using Bimaterial Semicircular Bend Test Specimen." *Transportation Research Board 96th Annual Meeting,* Washington D.C. 08-12 January 2017.
- Huang, K., Zollinger, D., **Shi, X.,** and Sun, P. "A developed method of analyzing temperature and moisture profiles in rigid pavement slabs." *The 11th International Conference on Concrete Pavement,* San Antonio, Texas, 28 August- 01 September 2016.
- Rew, Y., **Shi, X.,** and Park, P. "Graphite added heated pavement for deicing." *US-Korea conference,* Atlanta, Georgia, 29 July-01 August 2015.

COMMERCIALIZATION

- **Shi, X.,** Grasley, Z., and Mukhopadhyay, A. *Eco-Friendly, Crack-Resistant Cementitious Materials*. (A US patent application was filed on Dec 4, 2020).
- **Shi, X.**, Grasley, Z., and Kruse, D. co-founded Circle Concrete Tech Inc , an Austin TX based startup company centered upon innovation that markedly reduces the tremendous environmental impacts of the concrete industry

MEMBERSHIP

Transportation Research Board (TRB)

- AKP20 Standing Committee on Design and Rehabilitation of Concrete Pavements (Member)

American Concrete Institute (ACI)

- ACI 555 Concrete with Recycled Materials (Voting Member)
  - ACI 555-A Development of ACI 555-1R Technical Report (Chair)
- ACI 565 Lunar Concrete (Voting Member)
- ACI 221 Aggregates (Associate Member)
- ACI 236 Material Science of Concrete (Associate Member)

American Society of Civil Engineers (ASCE)

- Member

World Transport Convention (WTC)

- Co-chair, Concrete Pavements Committee

International Association of Chinese Infrastructure Professionals (IACIP)

- Co-chair of the Organizing Committee for the 11th IACIP Annual Workshop
- Organizing Committee (Co-chair of the Presentation Planning Subcommittee) for the 10th IACIP Annual Workshop

Transportation Research Congress (TRC)

- Young Members Technical Committee (Member)

ADDITIONAL QUALIFICATION

- Professional Engineer, **Texas #138609**
- Business Management Certificate, **Mays Business School, Texas A&M University**
- Professor Training Course, **National Center for Asphalt Technology at Auburn University**
- X-ray CT Short Course, **High-Resolution X-ray CT Facility, University of Texas at Austin**

AWARDS & SERVICE

Awards

- 2022 NASA MINDS Grand Champion at the Underclass Level
- 2021 USDA E. Kika De La Garza Fellow
- 2021 Texas State New Ventures Winner, Plient Concrete ($20,000 in non-dilutive startup funding)
- Selected as one of the six young professionals to represent ACI to attend the 2022 Emerging Leaders Alliance Program
- 2017 International Association of Chinese Infrastructure Professionals Outstanding Graduate Student Award

Editing Board & Reviewers

- Junior Editor for *Journal of Infrastructure Preservation and Resilience*
- Guest Associate Editor for *Frontiers in Built Environment*
- Editor for *Engineering Solid Mechanics*
- Reviewed over 200 journal papers for *Cement and Concrete Composites*, *Transportation Research Record: Journal of the Transportation Research Board*, *Journal of Transportation Engineering Part B*, *Journal of Cleaner Production*, *Road Materials and Pavement Design*, *Construction and Building Materials*, *Resources, Conservation and Recycling, Materials, Infrastructures, and Heliyon.*

Student Mentoring

- Trained on postdoc who is now an Assistant Professor at Indian Institute of Technology Bombay
- Graduated two MS students
- Currently advise eight undergraduate students, three MS students, one PhD student, and one postdoc