Junliang “Julian” Tao

PhD, Associate Professor

Curriculum Vitae
November 2024

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Education

PhD	Civil Engineering	Case Western Reserve University	Cleveland, US	2013
MS	Civil Engineering	Tongji University	Shanghai, China	2009
BS	Civil Engineering	China University of Geosciences	Wuhan, China	2006

Experiences

2018–	**Associate Professor**	School of Sustainable Engineering and the Built Environment, Arizona State University
2022	**Guest Professor**	Institute of Geotechnical Engineering, University of Natural Resources and Life Sciences (BOKU)
2013–2018	**Assistant Professor**	Department of Civil Engineering, University of Akron

Honors and Awards

2020	The 10th Anniversary Excellent Paper Award, Journal of Rock Mechanics and Geotechnical Engineering
2017	CAREER Award, National Science Foundation
2017	Gary W. Johnson Young Civil Engineer of the Year Award, ASCE Akron-Canton Section
2017	Excellent Paper Award, The 2017 International Conference on Transportation Infrastructure and Materials
2017	Keynote Speaker, The 2nd Transportation Research Congress, Beijing, China
2016	Summer Faculty Fellowship, University of Akron
2015	Highlight paper, IFCEE 2015
2014	Biomimicry Research and Innovation Center Research Incentive Grant, University of Akron
2014	ExCEED 2014 Teaching Fellow, ASCE
2013	Geo-institute Travel Award, ASCE Geo-congress 2013
2013	Roy Harley Prize, Case Western Reserve University
2012	Highlight paper, Smart Materials and Structures
2012	USUCGER Travel Award, 1st USUCGER Early Career Geotechnical Conference and NSF CMMI Research and Innovation Conference
2012	Craig J. Miller Memorial Award, Case Western Reserve University
2011	SGS-Graduate Student Travel Award, Case Western Reserve University

Mission Statement

I am leading the research group Bio-inspired Geotechnics (BiG) in the NSF Research Center for Bio-mediated and Bio-inspired Geotechnics at Arizona State University. Our mission is to discover the fundamental mechanisms of various interactions between living things and geological materials, to abstract these mechanisms to engineering design principles, and to translate the design principles to autonomous, efficient, sustainable and intelligent geotechnics. We seek the answers at the boundaries of biology, mechanics and engineering. We achieve the BiG goals and extend the impacts from research, teaching, outreach, entrepreneurship and collaboration. Our Current research topics include: bio-inspired self-burrowing robots, bio-inspired underground sensing and communication, bio-inspired sustainable countermeasures to natural hazards.

Professional Membership

Associate Member	American Society of Civil Engineers (ASCE) Geo-Institute
Member	International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)
Member	Society for Integrative and Comparative Biology (SICB)
Member	Institute of Electrical and Electronics Engineers (IEEE)
Member	International Society for Optical Engineering (SPIE)
Member	Transportation Research Board (TRB)

PUBLICATIONS, INTELLECTUAL PROPERTY AND PRESENTATIONS

Summary of Publications and Intellectual Property

Total Publications	115
Books Co-Edited	3
Invited Journal Publications	1
Invited Conference Papers	3
Refereed Conference Papers	66
Technical Reports or other papers (non-refereed)	5
Journal publications from ASU	23
Journal Publications Prior to ASU (All Published)	21
Manuscripts Submitted or In Revision from ASU	4
Patents; Patents pending	2

Summary of Presentations

Invited Presentation, External	33
Invited Presentation, Internal	2
Peer-reviewed Conference Presentations, including Students	52

Google Scholar Statistics (as of November 4, 2024)

h-index	19
i10-index	34
total citation	1654

Bold Font	Ph.D. Student for whom I am the primary advisor
Underline Font	Master’s Student for whom I am the primary advisor
#	Undergraduate Student
∞	Other/Visiting Student
×	Postdoctoral Researcher
‡	High School Student
+	Equal Contributions
~	Presenting Author

Journal Articles

1. **X Li**, J Tao, and L van Paassen*. Reactive Transport Modeling of Microbial-Induced Calcite Precipitation Treatment through Shallow Underwater Injection. *Computers and Geotechnics* **174** (2024), 106601. DOI: 10.1016/j.compgeo.2024.106601.
2. **X Li**, L van Paassen, and J Tao*. Effects of Sediment Densification and Strengthening on Scour around Monopiles Using Mangrove-Inspired Skirt Piles. *Acta Geotechnica* (2024). DOI: 10.1007/s11440-023-02182-y.
3. A Martinez and J Tao. Editorial for Special Issue on Bio-Inspired Geotechnics. *Acta Geotechnica* (2024). DOI: 10.1007/s11440-024-02323-x.

4. **Y Tang**, **Y Zhong**, and J Tao*. Bio-Inspired Rotational Penetration and Horizontal Self-Burrowing Soft Robot. *Acta Geotechnica* (2024). DOI: 10.1007/s11440-023-02173-z.
5. H Bagheri, D Stockwell, B Bethke, NK Okwae, D Aukes, J Tao, and H Marvi*. A Bio-Inspired Helically Driven Self-Burrowing Robot. *Acta Geotechnica* (2023). DOI: 10.1007/s11440-023-01882-9.
6. **Y Zhong**, S Huang×, and J Tao*. Minimalistic Horizontal Burrowing Robots. *Journal of Geotechnical and Geoenvironmental Engineering* **149**(4) (2023), 02823001. DOI: 10.1061/JGGEFK.GTENG-11468.
7. **X Li**, L van Paassen, and J Tao*. Investigation of Using Mangrove-Inspired Skirt Pile Group as a Scour Countermeasure. *Ocean Engineering* **266** (2022), 113133. DOI: 10.1016/j.oceaneng.2022.113133.
8. A Martinez*, J Dejong, I Akin, A Aleali, C Arson, J Atkinson, P Bandini, T Baser, R Borela, R Boulanger, M Burrall, Y Chen, C Collins, D Cortes, S Dai, T DeJong, E Del Dottore, K Dorgan, R Fragaszy, JD Frost, R Full, M Ghayoomi, DI Goldman, N Gravish, IL Guzman, J Hambleton, E Hawkes, M Helms, D Hu, L Huang, **S Huang**, C Hunt, D Irschick, HT Lin, B Lingwall, A Marr, B Mazzolai, B McInroe, T Murthy, K O’Hara, M Porter, S Sadek, M Sanchez, C Santamarina, L Shao, J Sharp, H Stuart, HH Stutz, A Summers, **J Tao**, M Tolley, L Treers, K Turnbull, R Valdes, L von Paassen, G Viggiani, D Wilson, W Wu, X Yu, and J Zheng. Bio-Inspired Geotechnical Engineering: Principles, Current Work, Opportunities and Challenges. *Géotechnique* **72**(8) (2022), 687–705. DOI: 10.1680/jgeot.20.P.170.
9. **Y Tang** and J Tao*. Multiscale Analysis of Rotational Penetration in Shallow Dry Sand and Implications for Self-Burrowing Robot Design. *Acta Geotechnica* **17** (2022), 4233–4252. DOI: 10.1007/s11440-022-01492-x.
10. C Wang, Y Yuan, F Liang*, and J Tao. Experimental Investigation of Local Scour around Cylindrical Pile Foundations in a Double-Layered Sediment under Current Flow. *Ocean Engineering* **251** (2022), 111084. DOI: 10.1016/j.oceaneng.2022.111084.
11. **Y Zhong** and J Tao*. Bio-Inspired Vibrational Wireless Underground Communication System. *Journal of Rock Mechanics and Geotechnical Engineering* **14** (2022). DOI: 10.1016/j.jrmge.2022.06.005.
12. D Li, **S Huang**, **Y Tang**, H Marvi, J Tao, and D Aukes*. Compliant Fins for Locomotion in Granular Media. *IEEE Robotics and Automation Letters* **6**(3) (2021), 5984–5991. DOI: 10.1109/LRA.2021.3084877.
13. J Tao. Burrowing Soft Robots Break New Ground. *Science Robotics* **6**(55) (2021). DOI: 10.1126/scirobotics.abj3615.
14. **S Huang**, **Y Tang**, H Bagheri, D Li, A Ardente#, D Aukes, H Marvi, and J Tao*. Effects of Friction Anisotropy on Upward Burrowing Behavior of Soft Robots in Granular Materials. *Advanced Intelligent Systems* **2**(6) (2020), 1900183. DOI: 10.1002/aisy.201900183.
15. **S Huang** and J Tao*. Modeling Clam-inspired Burrowing in Dry Sand Using Cavity Expansion Theory and DEM. *Acta Geotechnica* **15**(8) (2020), 2305–2326. DOI: 10.1007/s11440-020-00918-8.
16. H Li∞, J Tao*, L Wei, and Y Liu. Explosive Compaction Technology for Loess Embankment Settlement Control: Numerical Simulation and Field Implementation. *Acta Geotechnica* **15**(4) (2020), 975–997. DOI: 10.1007/s11440-019-00777-y.
17. J Tao*, **S Huang**, and **Y Tang**. SBOR: A Minimalistic Soft Self-Burrowing-out Robot Inspired by Razor Clams. *Bioinspiration & Biomimetics* **15**(5) (2020), 055003. DOI: 10.1088/1748-3190/ab8754.
18. J Tao*, **S Huang**, and **Y Tang**. Bioinspired Self-Burrowing-Out Robot in Dry Sand. *Journal of Geotechnical and Geoenvironmental Engineering* **145**(12) (2019), 02819002. DOI: 10.1061/(ASCE)GT.1943-5606.0002177.
19. X Wang∞ and J Tao*. Polymer-Modified Microbially Induced Carbonate Precipitation for One-Shot Targeted and Localized Soil Improvement. *Acta Geotechnica* **14**(3) (2019), 657–671. DOI: 10.1007/s11440-018-0757-z.
20. B Zhang*, Hx Wang, Yw Ye, Jl Tao, Lz Zhang, and L Shi. Potential Hazards to a Tunnel Caused by Adjacent Reservoir Impoundment. *Bulletin of Engineering Geology and the Environment* **78**(1) (2019), 397–415. DOI: 10.1007/s10064-017-1110-8.

21. **J Li** and J Tao*. CFD-DEM Two-Way Coupled Numerical Simulation of Bridge Local Scour Behavior under Clear-Water Conditions. *Transportation Research Record* **2672**(39) (2018), 107–117. DOI: 10.1177/0361198118783170.
22. J Tao*, **J Li**, X Wang∞, and R Bao. Nature-Inspired Bridge Scour Countermeasures: Streamlining and Biocementation. *Journal of Testing and Evaluation* **46**(4) (2018), 20170517. DOI: 10.1520/JTE20170517.
23. X Wang∞, J Tao*, R Bao, T Tran, and S Tucker-Kulesza. Surficial Soil Stabilization against Water-Induced Erosion Using Polymer-Modified Microbially Induced Carbonate Precipitation. *Journal of Materials in Civil Engineering* **30** (2018). DOI: 10.1061/(ASCE)MT.1943-5533.0002490.
24. R Bao, **J Li**, L Li, TJ Cutright, L Chen, J Zhu, and J Tao*. Effect of Microbial-Induced Calcite Precipitation on Surface Erosion and Scour of Granular Soils: Proof of Concept. *Transportation Research Record* **2657**(1) (2017), 10–18. DOI: 10.3141/2657-02.
25. **J Li**, J Tao*, and Y Liu. DES Modeling of Erosional Forces around Streamlined Piers and Implications for Scour Countermeasures. *International Journal of Geomechanics* **17**(6) (2017), 04016139. DOI: 10.1061/(ASCE)GM.1943-5622.0000839.
26. X Sun, J Tao, J Li, Q Dai*, and X Yu. Aeroelastic-aerodynamic analysis and bio-inspired flow sensor design for boundary layer velocity profiles of wind turbine blades with active external flaps. *Smart Structures and Systems* **20**(3) (2017), 311–328. DOI: 10.12989/sss.2017.20.3.311.
27. **H Tao** and J Tao*. Quantitative Analysis of Piping Erosion Micro-Mechanisms with Coupled CFD and DEM Method. *Acta Geotechnica* **12**(3) (2017), 573–592. DOI: 10.1007/s11440-016-0516-y.
28. J Tao* and **H Tao**. Factors Affecting Piping Erosion Resistance: Revisited with a Numerical Modeling Approach. *International Journal of Geomechanics* **17**(11) (2017), 04017097. DOI: 10.1061/(ASCE)GM.1943-5622.0000999.
29. J Tao* and J Hu. Energy Harvesting from Pavement via Polyvinylidene Fluoride: Hybrid Piezo-Pyroelectric Effects. *Journal of Zhejiang University-SCIENCE A* **17**(7) (2016), 502–511. DOI: 10.1631/jzus.A1600166.
30. J Tao and X Yu*. Bio-Inspired Directional Sensor with Piezoelectric Microfiber and Helical Electrodes. *Journal of Intelligent Material Systems and Structures* **27**(13) (2016), 1755–1766. DOI: 10.1177/1045389X15610904.
31. Q Gao, J Tao, J Hu, and X Yu*. Laboratory Study on the Mechanical Behaviors of an Anisotropic Shale Rock. *Journal of Rock Mechanics and Geotechnical Engineering* **7**(2) (2015), 213–219. DOI: 10.1016/j.jrmge.2015.03.003.
32. **J Li** and J Tao*. Streamlining of Bridge Piers as Scour Countermeasures: Optimization of Cross Sections. *Transportation Research Record* **2521**(1) (2015), 162–171. DOI: 10.3141/2521-17.
33. J Tao* and **J Li**. Streamlining of Bridge Piers as Scour Countermeasures: Effects of Curvature of Vertical Profiles. *Transportation Research Record* **2521**(1) (2015), 172–182. DOI: 10.3141/2521-18.
34. B Zhang*, L Zhang, H Yang, Z Zhang, and J Tao. Subsidence Prediction and Susceptibility Zonation for Collapse above Goaf with Thick Alluvial Cover: A Case Study of the Yongcheng Coalfield, Henan Province, China. *Bulletin of Engineering Geology and the Environment* **75** (2015). DOI: 10.1007/s10064-015-0834-6.
35. R Wang*, J Tao, B Yu, and L Dai. Characterization of Multiwalled Carbon Nanotube-Polymethyl Methacrylate Composite Resins as Denture Base Materials. *The Journal of Prosthetic Dentistry* **111**(4) (2014), 318–326. DOI: 10.1016/j.prosdent.2013.07.017.
36. JY Hu, BX Yu*, and J Tao. Innovative Chromogenic Materials for Pavement Life Extension: Modeling Study of Surface Temperature of Sustainable Asphalt Pavement. *International Journal of Pavement Research and Technology* **6**(2) (2013). DOI: 10.6135/ijprt.org.tw/2013.6(2).141.
37. Z Liu, B Zhang, X Yu*, J Tao, Y Sun, and Q Gao. Thermally Induced Water Flux in Soils. *Transportation Research Record* **2349**(1) (2013), 63–71. DOI: 10.3141/2349-08.
38. Y Sun, CY Chung, X Yu*, Z Liu, and J Tao. Advanced Ultrasonic Technology for Air Void Distribution in Concrete. *Materials Evaluation* **71**(3) (2013).

39. Y Sun, X Yu*, Z Liu, Y Liu, and J Tao. Advanced Ultrasonic Technology for Freezing Damage Prevention of Concrete Pavement. *International Journal of Pavement Research and Technology* **6**(2) (2013). DOI: 10.6135/ijprt.org.tw/2013.6(2).86.
40. J Tao, Y Sun, G Wu, and X Yu*. Emulating the Directional Sensitivity of Fish Hair Cell Sensor. *Journal of Intelligent Material Systems and Structures* **24**(12) (2013), 1484–1493. DOI: 10.1177/1045389X12473378.
41. X Yu, B Zhang, J Tao, and X Yu*. A New Time-Domain Reflectometry Bridge Scour Sensor. *Structural Health Monitoring* **12**(2) (2013), 99–113. DOI: 10.1177/1475921713476331.
42. Z Liu, XB Yu*, Jl Tao, and Y Sun. Multiphysics Extension to Physically Based Analyses of Pipes with Emphasis on Frost Actions. *Journal of Zhejiang University SCIENCE A* **13**(11) (2012), 877–887. DOI: 10.1631/jzus.A12ISGT2.
43. Z Liu, B Zhang, X Yu*, and J Tao. A New Method for Soil Water Characteristic Curve Measurement Based on Similarities Between Soil Freezing and Drying. *Geotechnical Testing Journal* **35**(1) (2012), 2–10. DOI: 10.1520/GTJ103653.
44. J Tao and X Yu*. Hair Flow Sensors: From Bio-Inspiration to Bio-Mimicking—a Review. *Smart Materials and Structures* **21**(11) (2012), 113001. DOI: 10.1088/0964-1726/21/11/113001.

Papers in Refereed Conference Proceedings

1. Z Xue, C Zhao, and J Tao. Reducing Penetration Resistance through Bio-Inspired Head Oscillation. In: *IOP Conference Series: Earth and Environmental Science*. GeoShanghai 2024. Vol. 1337. Shanghai, China: IOP Publishing, 2024, pp.012040. DOI: 10.1088/1755-1315/1337/1/012040.
2. **X Li**~, J Tao*, and L van Paassen. Effects of the Submerged Height of Mangrove-Inspired Skirt-Pile Group on Scour Mitigation around a Monopile Foundation. In: *Geo-Congress 2023*. Geo-Congress 2023. Los Angeles, California: ASCE, 2023, pp.442–450. DOI: 10.1061/9780784484708.041.
3. MR Shaharear~, Y Tang*, **X Li**, and J Tao. Penetration Forces of a Rotating Helical Penetrator in Granular Media: Experiments and Insights into the Design of a Burrowing Robot. In: *Geo-Congress 2023*. Geo-Congress 2023. Los Angeles, California: ASCE, 2023, pp.230–238. DOI: 10.1061/9780784484708.021.
4. **S Shahhosseini**~, M Parekh#, and J Tao*. DEM-MBD Coupled Simulation of a Burrowing Robot in Dry Sand. In: *Geo-Congress 2023*. Geo-Congress 2023. Los Angeles, California: ASCE, 2023, pp.309–317. DOI: 10.1061/9780784484692.032.
5. **Y Tang**~ and J Tao*. Experimental Study on Continuous and Oscillatory Rotational Penetration. In: *Geo-Congress 2023*. Geo-Congress 2023. Los Angeles, California: ASCE, 2023, pp.303–311. DOI: 10.1061/9780784484708.028.
6. **Y Tang**~ and J Tao*. Penetration Effect of Penetrator Geometry and Interface Friction on Rotational Penetration Resistance. In: *Geo-Congress 2023*. Geo-Congress 2023. Los Angeles, California: ASCE, 2023, pp.257–265. DOI: 10.1061/9780784484708.024.
7. **Y Zhong**~ and J Tao*. Comparative Analysis of Horizontal Self-Burrowing Strategies Using Full-Scale DEM-MBD Co-Simulations. In: *Geo-Congress 2023*. Geo-Congress 2023. Los Angeles, California: ASCE, 2023, pp.106–114. DOI: 10.1061/9780784484692.011.
8. **S Huang**~, N Mahabadi, and J Tao*. Penetration and Relaxation in Dry Granular Materials: Insights from Photoelasticity. In: *Geo-Congress 2022*. Geo-Congress 2022. Charlotte, North Carolina: American Society of Civil Engineers, 2022, pp.130–139. DOI: 10.1061/9780784484043.013.
9. **S Huang**~ and J Tao*. Bioinspired Horizontal Self-Burrowing Robot. In: *Geo-Congress 2022*. Geo-Congress 2022. Charlotte, North Carolina: American Society of Civil Engineers, 2022, pp.223–231. DOI: 10.1061/9780784484036.023.
10. **X Li**~, J Tao, and L van Paassen*. Numerical Simulations of Mangrove-Inspired Sacrificial Pile Group for Scour Mitigation. In: *Geo-Congress 2022*. Geo-Congress 2022. Charlotte, North Carolina: American Society of Civil Engineers, 2022, pp.385–394. DOI: 10.1061/9780784484050.040.

11. **Y Tang**~ and J Tao*. Effect of Rotational Cone on Penetration Resistance and Its Implication to the Design of a Bio-Inspired Self-Burrowing Robots. In: *Geo-Congress 2022*. Geo-Congress 2022. Charlotte, North Carolina: American Society of Civil Engineers, 2022, pp.214–222. DOI: 10.1061/9780784484036.022.
12. **Y Zhong**~ and J Tao*. Bio-Inspired Vibrational Transmitters for Wireless Underground Communication. In: *Geo-Congress 2022*. Geo-Congress 2022. Charlotte, North Carolina: American Society of Civil Engineers, 2022, pp.43–52. DOI: 10.1061/9780784484067.005.
13. **S Huang**~, N Mahabadi, and J Tao*. Visualization of a Model Razor Clam Interacting with Dry Granular Materials Using Photoelasticity. In: *American Physical Society March Meeting 2021*. American Physical Society March Meeting 2021. Zoom, 2021.
14. **Y Tang**~ and J Tao*. Effect of Rotation on Penetration: Toward a Seed Awn-Inspired Self-Burrowing Probe. In: *IFCEE 2021*. The International Foundations Congress & Equipment Expo (IFCEE). Dallas, TX: American Society of Civil Engineers, 2021, pp.149–159. DOI: 10.1061/9780784483428.016.
15. **Y Zhong**~, Y Gao∞, and J Tao*. Bio-Inspired Underground Communication Using Seismic Waves. In: *IFCEE 2021*. The International Foundations Congress & Equipment Expo (IFCEE). Dallas, TX: American Society of Civil Engineers, 2021, pp.139–148. DOI: 10.1061/9780784483428.015.
16. **S Huang**~, N Mahabadi, and J Tao*. Impact of Shell Opening of a Model Razor Clam on the Evolution of Force Chains in Granular Media. In: *Geo-Congress 2021: Biogeotechnics*. Geo-Congress 2020. Minneapolis, Minnesota: ASCE, 2020, pp.272–281. DOI: 10.1061/9780784482834.030.
17. **S Huang**~ and J Tao*. Bio-Inspired Dual-Anchor Burrowing: Effect of Vertical Curvature of the Shell. In: *Geo-Congress 2020*. Geo-Congress 2020. Minneapolis, Minnesota: ASCE, 2020, pp.282–292. DOI: 10.1061/9780784482834.031.
18. **Y Tang**~, **S Huang**, and J Tao*. Effect of Rotation on Seeds' Self-Burial Process: Insights from DEM Simulations. In: *Geo-Congress 2020*. Geo-Congress 2020. Minneapolis, Minnesota: ASCE, 2020, pp.293–301. DOI: 10.1061/9780784482834.032.
19. **S Huang**~ and J Tao*. Modeling of the Burrowing Mechanism by Razor Clam: Role of Penetration Kinematics. In: *IFCEE 2018*. IFCEE 2018. Orlando, Florida: ASCE, 2018, pp.547–556. DOI: 10.1061/9780784481585.053.
20. **S Huang** and J Tao*~. The Interplay between Shell Opening and Foot Penetration of a Model Razor Clam: Insights from DEM Simulation. In: *B2G Atlanta 2018 Bio-mediated and Bio-inspired Geotechnics*. B2G Atlanta 2018 Bio-mediated and Bio-inspired Geotechnics. Atlanta, GA, 2018. https://par.nsf.gov/servlets/purl/10061092.
21. **J Li**~ and J Tao*. Experimental Investigation of Granular Bulk Density Effect on Bridge Local Scour under Clear-Water Conditions. In: *IFCEE 2018*. IFCEE 2018. Orlando, Florida: ASCE, 2018, pp.735–745. DOI: 10.1061/9780784481578.070.
22. Pandey, G and J Tao*~. Moisture Sensitive Polymer-Modified Enzyme-Induced Carbonate Precipitation for Soil Improvement. In: *B2G Atlanta 2018 Bio-mediated and Bio-inspired Geotechnics*. B2G Atlanta 2018 Bio-mediated and Bio-inspired Geotechnics. Atlanta, GA, 2018.
23. **H Tao**~ and J Tao*. Conceptual Model of Critical Hydraulic Gradient for Piping Considering Friction Resistance. In: *IS-Atlanta2018: Geo-mechanics from Micro to Macro*. IS-Atlanta2018: Geo-mechanics from Micro to Macro. Atlanta, GA, 2018.
24. **H Tao**~ and J Tao*. Impact of Gradation Change on Mechanical Behavior of Soil: DEM and Community Detection. In: *Proceedings of GeoShanghai 2018 International Conference: Fundamentals of Soil Behaviours*. Proceedings of GeoShanghai 2018 International Conference. Ed. by A Zhou, J Tao, X Gu, and L Hu. Singapore: Springer, 2018, pp.959–966. DOI: 10.1007/978-981-13-0125-4_106.
25. **H Tao**~ and J Tao*. Quantifying the Effect of Suffusion on Strength of Soil Using Network-Science Based Community Detection Method. In: *Transportation Research Board 97th Annual Meeting*. Transportation Research Board 97th Annual Meeting. Washington DC, United States, 2018, pp.15p. https://trid.trb.org/view/1496769.

26. X Wang$^{\infty}$ and J Tao$^{*\sim}$. Polymer-Modified Microbially-Induced Carbonate Precipitation Treatment Method for Surface Erosion Prevention. In: *Transportation Research Board 97th Annual Meeting*. Transportation Research Board 97th Annual Meeting. Washington DC, United States, 2018, pp.16p. https://trid.trb.org/view/1496755.
27. R Bao, **J Li**, L Li, TJ Cutright, L Chen, J Zhu, and J Tao$^{*\sim}$. Bio-Inspired Bridge Scour Countermeasures: Streamlining and Biocementation. In: *DEStech Transactions on Materials Science and Engineering*. The 2017 International Conference on Transportation Infrastructure and Materials (ICTIM). Shandong, China, 2017. DOI: 10.12783/dtmse/ictim2017/10180.
28. **S Huang**$^{\sim}$ and J Tao*. A DEM Study of Penetrating in Granular Materials with Changing Shape. In: *TRB 96th Annual Meeting Compendium of Papers*. Transportation Research Board 96th Annual Meeting. Washington, DC, 2017, pp.14. https://trid.trb.org/view/1439217.
29. **S Huang**$^{\sim}$ and J Tao*. Penetrating in Granular Materials: Effects of Penetrator Dynamics. In: *Geotechnical Frontiers 2017*. Geotechnical Frontiers 2017. Orlando, Florida: ASCE, 2017, pp.604–613. DOI: 10.1061/9780784480441.063.
30. **J Li**$^{\sim}$ and J Tao*. Experimental Investigation of the Pier Streamlining Effect on Bridge Local Scour under Clear Water Conditions. In: *Geotechnical Frontiers 2017*. Geotechnical Frontiers 2017. Orlando, Florida: ASCE, 2017, pp.20–28. DOI: 10.1061/9780784480465.003.
31. **H Tao**$^{\sim}$ and J Tao*. Numerical Modeling and Analysis of Suffusion Patterns for Granular Soils. In: *Geotechnical Frontiers 2017*. Geotechnical Frontiers 2017. Orlando, Florida: ASCE, 2017, pp.487–496. DOI: 10.1061/9780784480472.051.
32. **H Tao**$^{\sim}$ and J Tao*. Suffusion Patterns for Granular Soils: Observations from Numerical Simulations. In: *TRB 96th Annual Meeting Compendium of Papers*. Transportation Research Board 96th Annual Meeting. Washington DC, United States, 2017, pp.19p. https://trid.trb.org/view/1438519.
33. M Cymbal$^{\#}$, **H Tao**, and J Tao$^{*\sim}$. Underwater Inspection with Remotely Controlled Robot and Image Based 3D Structure Reconstruction Techniques. In: *Transportation Research Board 95th Annual MeetingTransportation Research Board*. Transportation Research Board 95th Annual MeetingTransportation Research Board. Washington DC, United States, 2016, pp.15p. https://trid.trb.org/view/1394427.
34. J Hu and J Tao. Energy Harvesting from Pavement via PVDF: Hybrid Piezo-Pyroelectric Effects. In: *Geo-Chicago 2016*. Geo-Chicago 2016. Chicago, Illinois: ASCE, 2016, pp.556–566. DOI: 10.1061/9780784480137.053.
35. **J Li**$^{\sim}$, Y Liu, and J Tao*. Streamlining of Bridge Piers as Scour Countermeasures: Insights from DES Modeling. In: *Fourth Geo-China International Conference*. Fourth Geo-China International Conference. Shandong, China: ASCE, 2016, pp.85–92. DOI: 10.1061/9780784480069.011.
36. **J Li**$^{\sim}$ and J Tao*. Coherent Dynamics of a Turbulence Structure around Streamlined Piers. In: *Geo-Chicago 2016*. Geo-Chicago 2016. Chicago, Illinois: ASCE, 2016, pp.651–660. DOI: 10.1061/9780784480151.064.
37. **J Li**$^{\sim}$ and J Tao*. DES Investigation of the Effect of Pier Streamlining on Coherent Dynamics of the Turbulence Structure Around Piers. In: *TRB 95th Annual Meeting Compendium of Papers*. Transportation Research Board 95th Annual Meeting. Washington DC, United States: TRB, 2016, pp.14p. https://trid.trb.org/view/1393582.
38. **J Li**$^{\sim}$ and J Tao*. DES Investigation of the Effect of Pier Streamlining on Coherent Dynamics of the Turbulence Structure Around Piers. In: *2016 Geotechnical and Structural Engineering Congress*. 2016 Geotechnical and Structural Engineering Congress. Phoenix, Arizona, US: ASCE, 2016, pp.14p.
39. Y Liu, J Tao, X Yu, Z Liu, and X Yu*. Characterization of Freezing Fresh Concrete by Multiple Non-Destructive Methods. In: *Fourth Geo-China International Conference*. Fourth Geo-China International Conference. Shandong, China: ASCE, 2016, pp.125–135. DOI: 10.1061/9780784480021.017.
40. Mopur, Gothem, J Tao$^{*\sim}$, and Liang, Robert. Stabilization of Peat Subgrade for Existing Roadways Using Geosynthetics Encased Polyurethane Foam Columns: Laboratory Feasibility Study. In: *2016 Geotechnical and Structural Engineering Congress*. 2016 Geotechnical and Structural Engineering Congress. Phoenix, Arizona, US: ASCE, 2016, pp.14p.

41. **H Tao**~ and J Tao*. CFD-DEM Modeling of Piping Erosion Considering the Properties of Sands. In: *Geo-Chicago 2016*. Geo-Chicago 2016. Chicago, Illinois: ASCE, 2016, pp.641–650. DOI: 10.1061/9780784480151.063.
42. **H Tao**~ and J Tao*. Numerical Modeling of the Mechanisms of Piping Erosion with Coupled CFD and DEM Method. In: *TRB 95th Annual Meeting Compendium of Papers*. Transportation Research Board 95th Annual Meeting. Washington DC, United States, 2016, pp.17p. https://trid.trb.org/view/1393574.
43. J Tao*, J Hu, and G Wu. Energy Harvesting from Pavements via PVDF: Hybrid Piezo-Pyroelectric Effects. In: *2016 SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring*. SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring. Ed. by G Park. Las Vegas, Nevada, United States, 2016, pp.97992L. DOI: 10.1117/12.2218369.
44. **J Li**~, J Tao, and X Yu*. Streamlining of Bridge Pier as a Scour Countermeasure: A Feasibility Study. In: *IFCEE 2015*. IFCEE 2015. San Antonio, Texas: ASCE, 2015, pp.319–329. DOI: 10.1061/9780784479087.032.
45. B Yu*, X Yu, J Tao, and Y Guo. Innovative Multiscale Sensing and Computational Simulations for Bridge Scour Risk Management. In: *6th International Conference on Advances in Experimental Structural Engineering 11th International Workshop on Advanced Smart Materials and Smart Structures Technology*. 6th International Conference on Advances in Experimental Structural Engineering; 11th International Workshop on Advanced Smart Materials and Smart Structures Technology. Urbana-Champaign, United States, 2015. http://sstl.cee.illinois.edu/papers/aeseancrisst15/318_Yu_Innovative.pdf.
46. Q Gao~, JL Tao, JY Hu*, and X Yu. Mechanical Behaviors of an Anisotropic Shale Rock. In: *Shale Energy Engineering Conference 2014*. Shale Energy Engineering Conference 2014. Pittsburgh, Pennsylvania, United States: ASCE, 2014, pp.159–167. DOI: 10.1061/9780784413654.017.
47. Q Gao, J Hu, J Tao, and X Yu. Experimental Characterization of the Anisotropic Behaviors of Shale Rock. In: *Geo-Congress 2014*. Geo-Congress 2014. Atlanta, Georgia: ASCE, 2014, pp.563–571. DOI: 10.1061/9780784413272.054.
48. J Tao~, X Yu, and XB Yu*. Design and Application of A Field Bridge Scour Monitoring Sensor Based on TDR. In: *Transportation Research Board 93rd Annual Meeting*. Transportation Research Board 93rd Annual Meeting. Washington DC, United States, 2014, pp.16p. https://trid.trb.org/view/1289359.
49. J Tao~ and X Yu*. Flow and Scour Patterns around Bridge Piers with Different Configurations: Insights from CFD Simulations. In: *Geo-Congress 2014*. Geo-Congress 2014. Atlanta, GA: ASCE, 2014, pp.2655–2664. DOI: 10.1061/9780784413272.256.
50. J Tao~ and X Yu*. Influence of Shunt-damping Circuit on the Dynamic Response of a Bio-Inspired Piezoelectric Micropillar Sensor. In: *Bioinspiration, Biomimetics, and Bioreplication 2014*. SPIE 2014. Vol. 9055. San Diego, California, USA: International Society for Optics and Photonics, 2014, pp.90550J. DOI: 10.1117/12.2057518.
51. J Tao~ and X Yu*. Sediment Transport Model Considering Turbulent Flow. In: *Geo-Congress 2014*. Geo-Congress 2014. Atlanta, GA: ASCE, 2014, pp.1072–1080. DOI: 10.1061/9780784413272.104.
52. J Huang, J Tao, and X Yu*. Feasibility analyses of carbon nanotubes for the design of a new hair flow sensor. In: *Structural Health Monitoring 2013: A Roadmap to Intelligent Structures - Proceedings of the 9th International Workshop on Structural Health Monitoring, IWSHM 2013*. 9th International Workshop on Structural Health Monitoring: A Roadmap to Intelligent Structures, IWSHM 2013. Stanford, CA: DEStech Publications, 2013, pp.2138–2146. https://asu.pure.elsevier.com/en/publications/feasibility-analyses-of-carbon-nanotubes-for-the-design-of-a-new-.
53. Y Sun, J Tao, G Wu, and X Yu*. A Non-Contact Wearable Wireless Body Sensor Network for Multiple Vital Signal Detection. In: *2013 IEEE SENSORS*. 2013 IEEE SENSORS. Baltimore, MD, USA: IEEE, 2013, pp.1–4. DOI: 10.1109/ICSENS.2013.6688328.
54. J Tao~ and X Yu*. Optimization of bio-inspired piezoelectric composite hair sensor - Mechanical impedance matching. In: *Structural Health Monitoring 2013: A Roadmap to Intelligent Structures - Proceedings of the 9th International Workshop on Structural Health Monitoring, IWSHM 2013*. 9th International Workshop on Structural Health Monitoring: A Roadmap to Intelligent Structures, IWSHM 2013.

Stanford, CA: DEStech Publications, 2013, pp.2157–2165. https://asu.pure.elsevier.com/en/publications/optimization-of-bio-inspired-piezoelectric-composite-hair-sensor-.

55. J Tao, Q Gao, and X Yu*. Assessment of the Effects of Pier Configurations on the Flow Pattern and Scour: A CFD Modeling Approach. In: *TRB 92nd Annual Meeting Compendium of Papers DVD*. Transportation Research Board 92nd Annual Meeting. Washington DC, United States, 2013, pp.18p. https://trid.trb.org/view/1241688.
56. J Tao~, X Yu, and X Yu*. Real-Time TDR Field Bridge Scour Monitoring System. In: *Structures Congress 2013*. Structures Congress 2013. Pittsburgh, Pennsylvania, United States: ASCE, 2013, pp.2996–3009. DOI: 10.1061/9780784412848.262.
57. J Tao~ and X Yu*. A Framework for Numerical Simulation of Bridge Scour Focusing on the Improvements of Sediment Transport Models. In: *TRB 92nd Annual Meeting Compendium of Papers*. Transportation Research Board 92nd Annual Meeting. Washington DC, United States, 2013, pp.19p. https://trid.trb.org/view/1241695.
58. Z Liu, X Yu*, J Tao, G Wu, and Y Sun. Thermo-Hydro-Mechanical Modeling of Soil Pipe Interactions in Cold Weather Conditions. In: *Transportation Research Board 91st Annual Meeting*. Transportation Research Board 91st Annual Meeting. Washington DC, United States, 2012, pp.15p. https://trid.trb.org/view/1130249.
59. Y Sun, X Yu*, Z Liu, Y Liu, and J Tao. Advanced Ultrasonic Technology for Measurement of Air Void Size Distribution in Concrete. In: *TRB 91st Annual Meeting Compendium of Papers DVD*. Transportation Research Board 91st Annual Meeting. Washington DC, United States, 2012, pp.17p. https://trid.trb.org/view/1130349.
60. X Yu~, J Tao*, and X Yu. Comparison Study on Computer Simulations for Bridge Scour Estimation. In: *Georisk 2011*. Georisk 2011. Atlanta, Georgia, United States: ASCE, 2012, pp.1125–1132. DOI: 10.1061/41183(418)123.
61. Z Liu, B Zhang, X Yu*, B Zhang, and J Tao. A New Freezing Method for Soil Water Characteristic Curve Measurement. In: *TRB 90th Annual Meeting Compendium of Papers DVD*. Transportation Research Board 90th Annual Meeting. Washington, DC United States, 2011, pp.14p. https://trid.trb.org/view/1093119.
62. J Tao~, X Yu*, and J Berilla. Micropillar sensing element for bio-inspired flow sensors. In: *Structural Health Monitoring 2011: Condition-Based Maintenance and Intelligent Structures - Proceedings of the 8th International Workshop on Structural Health Monitoring*. 8th International Workshop on Structural Health Monitoring 2011: Condition-Based Maintenance and Intelligent Structures. Stanford, CA, 2011, pp.1732–1739. https://asu.pure.elsevier.com/en/publications/micropillar-sensing-element-for-bio-inspired-flow-sensors.
63. J Tao, M Richardson, X Yu*, B Zhang, Y Sun, and Z Liu. Performance Evaluation of a Wireless Sensor Network Protocol for Structural Health Monitoring. In: *Transportation Research Board 90th Annual Meeting*. Transportation Research Board 90th Annual Meeting. Washington DC, United States, 2011, pp.15p. https://trid.trb.org/view/1092923.
64. J Tao, X Yu*~, and J Berrilla. Bio-Inspired Flow and Acoustic Sensor. In: *Proc. SPIE 8019, Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Security and Homeland Defense X*. Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Security and Homeland Defense X. Vol. 8019. Orlando, Florida, United States: International Society for Optics and Photonics, 2011, pp.80190R. DOI: 10.1117/12.886564.
65. X Yu*~, J Tao, and J Berilla. A Bio-Inspired Flow Sensor. In: *Proc. SPIE 7646, Nanosensors, Biosensors, and Info-Tech Sensors and Systems 2010*. Nanosensors, Biosensors, and Info-Tech Sensors and Systems 2010. Vol. 7646. San Diego, California, United States: International Society for Optics and Photonics, 2010, pp.764618. DOI: 10.1117/12.849230.
66. X Yu*, B Zhang, J Tao, and Z Liu. Smart Pavement Sensor Based on Thermoelectricity Power. In: *Proc. SPIE 7647, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2010*. Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2010. Vol. 7647.

San Diego, California, United States: International Society for Optics and Photonics, 2010, pp.76470X. DOI: 10.1117/12.849227.

Preprints

1. D Li, **S Huang**, **Y Tang**, J Tao, H Marvi, and DM Aukes*. *Compliant Fins for Locomotion in Granular Media*. 2021. arXiv: 2101.03624. http://arxiv.org/abs/2101.03624. Pre-published.

Working Papers

1. S Huang, Y Tang, H Bagheri, D Li, D Aukes, H Marvi, and J Tao. “Self-Burrowing Mechanisms: Bioinsprations and Bio-Inspired Robots”. In preparation.
2. S Huang×, N Mahabadi, and J Tao*. “Photoelasticity Reveals Expansion-Penetration Interplay in Granular Packing”. 2024. In preparation.
3. **S Huang**, N Mahabadi, and J Tao*. “Visulizing Force and Displacement Fields in Soil-Structure Interactions Using Phtoelasticity”. 2024. In preparation.
4. **S Huang** and J Tao*. “The Interplay between Shell Opening and Foot Penetration of a Model Razor Clam”. 2024. In preparation.

Patents

1. J Tao, S Huang, Y Tang, and Y Zhong. “Bioinspired Horizontal Self-Burrowing Device”. U.S. pat. req. 18409006. Individual. 2024. https://patents.google.com/patent/US20240254839A1/en. Pending.
2. J Tao and Y Zhong. “Bio-Inspired Underground Vibrational Communication”. U.S. pat. req. 18419899. Individual. 2024. https://patents.google.com/patent/US20240250758A1/en. Pending.

Edited Books

1. L Hu, X Gu, J Tao, and A Zhou, eds. *Proceedings of GeoShanghai 2018 International Conference: Multi-physics Processes in Soil Mechanics and Advances in Geotechnical Testing*. Springer Singapore, 2018. https://www.springer.com/gp/book/9789811300943.
2. A Zhou, J Tao, X Gu, and L Hu, eds. *Proceedings of GeoShanghai 2018 International Conference: Fundamentals of Soil Behaviours*. Springer Singapore, 2018. https://www.springer.com/gp/book/9789811301247.
3. R Liang, J Qian, and J Tao, eds. *Advances in Soil Dynamics and Foundation Engineering*, *Geotechnical Special Publication No. 240*. Geo-Shanghai 2014. American Society of Civil Engineers, 2014. https://ascelibrary.org/doi/book/10.1061/9780784413425.

Technical Reports

1. Q Huang, J Thomas, and J Tao. *Evaluation of Effective Bridge Deck Repair Maintenance Methods*. Final Report FHWA/OH-2018-11. University of Akron; Ohio Department of Transportation, 2018, 35p. https://trid.trb.org/view/1565998.
2. J Tao. *Use of Crushed Recycled Glass in the Construction of Local Roadways Current Status of Recycled Glass Collection and Processing in the State of Ohio*. Final Report FHWA/OH-2017-19. University of Akron, 2017. https://rosap.ntl.bts.gov/view/dot/32288.
3. J Tao, J Li, S Huang, R Liang, A Ozdogan-Dolcek, and W Likos. *Performance Comparison of Abutment and Retaining Wall Drainage Systems*. Final Report FHWA/OH-2017-36. University of Akron; Ohio Department of Transportation, 2017, 200p. https://trid.trb.org/view/1507624.
4. J Tao, Z Luo, and G Pandey. *Evaluation of Post Flooding Shoulder Reconditioning - State Library of Ohio Digital Collection*. Final Report 974924814. Columbus, Ohio: University of Akron; Ohio Department of Transportation, 2017, p. 84. https://ohiomemory.org/digital/collection/p267401ccp2/id/14690/.
5. J Tao and R Liang. *Stabilization of Peat Deposits for Roadway Construction and Remediation*. Final Report FHWA/OH-2015/22. University of Akron; Ohio Department of Transportation, 2015, 85p. https://trid.trb.org/view/1371637.

PhD Thesis

1. J Tao. “Fusion of Numerical Modeling and Innovative Sensing to Advance Bridge Scour Research and Practice”. PhD thesis. Cleveland, Ohio: Case Western Reserve University, 2013. 256 pp. https://etd.ohiolink.edu/apexprod/rws_olink/r/1501/10?clear=10&p10_accession_num=case1372710604.

Invited Talks

2024–10	Burrowing Robotics: Bio-inspirations, Mechanisms and Prototypes. UV Underground of Universal Village (UV) Society Conference 2024. Boston
2024–04	Bio-inspired Burrowing Mechanisms and Robots. Northwestern University Civil Engineering SPREE Seminar. Evanston, IL
2023–12	Simulation-inspired Theory on Reciprocating Burrowing Robot. 2023 Machine-Ground Interaction Consortium (MaGIC). Madison, Wisconsin
2023–10	Bio-inspired Burrowing Mechanisms and Robots. Forum on Interdisciplinary Research Frontiers at 14th Chinese National Conference on Soil Mechanics and Geotechnical Engineering. Wuhan, China
2022–12	Short Course on Bio-inspired Geotechnics. University of Natural Resources and Life Sciences. Vienna, Austria
2022–12	Bio-inspired Geotechnics in a Nutshell. ASCE Web Conference on Bio-inspired Geotechnics. Virtual
2022–12	Bio-inspired active underground sensing network. ASCE Web Conference on Bio-inspired Geotechnics. Virtual
2022–11	An Introduction to Bio-inspired Geotechnics. Xi’an University of Technology. Virtual, Xi’an, China
2022–08	‘Ground-breaking’ bio-inspired geotechnics at ASU. Workshop on Bio- and Intelligent Geotechnics. Virtual, Chongqing University
2022–05	‘Ground-breaking’ bio-inspired geotechnics at ASU. Arizona Geo-Institute Member Meeting. Scottsdale, AZ
2022–05	Burrowing is a Geotechnical Engineering Problem. 18th Purdue Geotechnical Society Workshop. Purdue University
2022–04	Bio-inspired Scour Countermeasured. ASCE SEI Bio-inspired Structures Committee Lightning Talk. Virtual and Altlanta, Georgia
2022–04	Burrowing and Symmetry Breaking. Workshop on Grand Challenges for Burrowing Soft Robots, Robosoft 2022. Virtual and Edingburgh, Scotland
2021–06	Bio-inspired Geotechnics and Self-burrowing robot. ASCE SEI Bio-inspired Structures Committee Lightning Talk. Virtual
2021–02	Bio-inspired Geotechnics and Self-burrowing robot. PITT Geotechnical Colloquium Series. Virtual and Pittsburgh, Pennsylvania, United States
2020–01	SBOR: a minimalistic soft self-burrowing-out robot inspired by razor clams. Seminar for Center of Bio-mediated and Bio-inspired Geotechnics. Tempe, AZ, USA
2019–07	Overview and Reflections of the Course Bioinspired Design at ASU. 1st International Workshop on Bioinspired Geotechnics. Pacific Grove, CA
2019–06	Razor clam inspired burrowing robot. University of California, Davis. Davis, CA, USA
2019–05	Bio-inspired Geotechnics. 2019 CBBG REU/RET/YS Onboarding. Tempe, AZ, USA
2019–03	Bio-inspired Geotechnics. WSU Civil Engineering Graduate Seminar Series. Virtual and WSU
2018–08	Bio-inspired Geotechnics. US-Korea Conference on Science, Technology and Entrepreneurship. New York, NY
2018–09	Bridge Scour and its Countermeasures: Streamlining, Biocementation and Monitoring. Geotechnical Special Presentation, Arizona Chapters for the Geo-Institute and Association of Engineering and Environmental Geologists. Scottsdale, AZ
2018–05	Bio-inspired Geotechnics. Hohai University. Nanjing, China

2018–04	Bio-inspired Geotechnics and Self-burrowing robot. Geosciences Colloquium Series at University of Akron. Akron, Ohio, USA
2017–05	Bio-inspired Smart and Sustainable Infrastructure. The 2nd Transportation Research Congress. Beijing, China
2017–06	Bio-inspired Smart and Sustainable Infrastructure. Huazhong University of Science and Technology. Wuhan, Hubei, China
2017–06	Bio-inspired Smart and Sustainable Infrastructure. Hebei University of Technology. Tianjin, China
2017–06	Bio-inspired Smart and Sustainable Infrastructure. Tongji University. Shanghai, China
2017–05	Bio-inspired Smart and Sustainable Infrastructure. University of California, Davis. Davis, CA, USA
2016–01	Underwater Inspection with Remotely Controlled Robot and Image Based 3D Structure Reconstruction Techniques. Transportation Research Board 95th Annual Meeting. Washington DC, United States
2014–06	Bridge Scour: Monitoring, Sensing and Modelling. China University of Geosciences. Beijing, China
2014–06	Bridge Scour: Monitoring, Sensing and Modelling. Hebei University of Technology. Tianjin, China
2014–05	Bridge Scour: Monitoring, Sensing and Modelling. Tongji University. Shanghai, China
2014–05	Bridge Scour: Monitoring, Sensing and Modelling. Guilin University. Guilin, Guangxi, China
2013–03	Bridge Scour: Monitoring, Sensing and Modelling. The University of Akron. Akron, Ohio, USA
2013–03	Bridge Scour: Monitoring, Sensing and Modelling. Purdue University North Central. Westville, Indiana, USA

PROFESSIONAL ACTIVITIES AND SERVICE

Summary of Professional Activities and Service

Editor, Associate Editor for peer-reviewed journals	3
Member of Editorial Board	1
International/national conference chaired	2
International/national conference committees	4
International/national conference sessions organized	1
International/national conference sessions chaired	12
Peer Reviewer for Journals	32
Peer Reviewer for Conferences	1
Proposal Review Service for Funding Agencies	3
University-level Committees	1
Engineering School-level Committees	3
Unit-level Committees	9

Conference Organization

2025	Leading Member of Organizing Committee @International Conference on Biomediated and Bioinspired Geotechnics	Tempe, USA
2024	Co-chair of Technical Committee @GeoShanghai International Conference 2024 (GeoShanghai 2024)	Shanghai, China
2023	Session Chair of Session on Bioinspired Geotechnics @Engineering Mechanics Institute Conference	Atlanta, GA
2022	Co-chair of Organizing Committee @ASCE Web Conference on Bio-inspired Geotechnics	Virtial
2021	Track Chair of Track K: Scour and Erosion Countermeasures @The 10th International Conference on Scour and Erosion (ICSE-10)	Online
2021	Member of Organizing Committee @The 10th International Conference on Scour and Erosion (ICSE-10)	Online

2021	Session Chair of Advances in Ground Improvement Materials @The International Foundations Congress & Equipment Expo (IFCEE)	Online and Dallas, TX
2019	Session Chair of Session on Geotechnics of Soil Erosion @Geo-Congress 2019	Philadelphia, CA
2019	Session Chair of Session on Bioinspired Burrowing Excavation and Tunneling @Engineering Mechanics Institute Conference	Pasadena, CA
2019	Member of Organizing Committee @The 9th Annual IACIP Workshop	Washington, D.C.
2018	Member of Local Organizing Committee @Early Career Geotechnical Faculty Workshop	Cleveland, OH
2018	Co-Editor of Proceedings of GeoShanghai 2018 International Conference @The 4th GeoShanghai International Conference	Shanghai, China
2018	Member of Organizing Committee @International Conference on Transportation Infrastructure and Materials	Tianjin, China
2017	Session Chair of Technical Session on “Slope Stability and Retaining Walls” @World Transportation Convention	Beijing, China
2017	Session Chair of Technical Session on “Soil mechanics and behaviors” @International Conference on Transportation Infrastructure and Materials (ICTIM)	Beijing, China
2017	Session Organizer of MS 72 Recent Trends in Granular Materials Across the Scales @ASCE Engineering Mechanics Institute Conference	San Diego, CA
2017	Session Chair of Student poster competition @The 7th Annual IACIP Workshop	Washington, D.C.
2016	Session Chair of Technical Session on “Scour at Bridge and Structures: Mechanism Prediction and Countermeasures” @Geo-Chicago	Chicago, Illinois
2014	Co-Editor of Geotechnical Special Publication Volume 240 @The 3rd GeoShanghai International Conference	Shanghai, China
2014	Session Chair of Student poster competition @The 4th Annual IACIP Workshop	Washington, D.C.

Editorial Services

2022–	Associate Editor	Biogeotechnics
2022–2023	Co-editor	Special Issue on "Bio-inspired Geotechnics" by Acta Geotechnica
2022–2024	Co-editor	Special Issue on "Bio-inspired Burrowing Robots" by Frontiers in Robotics and AI
2017–	Editorial Board Member	Journal of Testing and Evaluation

Reviewing Services

Ad-hoc Reviewer	National Science Foundation
Panalist	National Science Foundation CMMI-ECI Program
Ad-hoc Reviewer	Hong Kong Research Grant Council
Acta Geotechnica	Springer
Canadian Geotechnical Journal	Canadian Science Publishing
Computers and Geomechanics	Elsevier
Construction and Building Materials	Elsevier
Engineering Geology	Elsevier
Engineering with Computers	Springer
Geotechnical Testing Journal	ASTM

Géotechnique	ICE
Granular Matter	Springer
International Journal of Heat and Mass Transfer	Elsevier
International Journal for Numerical and Analytical Methods in Geomechanics	Wiley
International Journal of Geomechanics	ASCE
International Journal of Geosynthetics and Ground Engineering	Springer
International Journal of Geotechnical Engineering	Taylor and Francis
Journal of Aerospace Engineering	ASCE
Journal of Geotechnical and Geoenvironmental Engineering	ASCE
Journal of Hydraulic Engineering	ASCE
Journal of Infrastructure Preservation and Resilience	Springer
Journal of Infrastructure Systems	ASCE
Journal of Materials in Civil Engineering	ASCE
Journal of Testing and Evaluations	ASTM
Journal of Transportation Engineering	ASCE
Journal of Renewable and Sustainable Energy	AIP
Materials and Design	Elsevier
Microsystem Technologies	Springer
Natural Hazards	Springer
Ocean Engineering	Elsevier
Powder Technology	Elsevier
Science Robotics	Science Magzine
Sensors	MDPI
Smart Structures and Systems, An International Journal	Techno Press
Underground Space	Elsevier
Regular reviewer for conferences	ASCE, TRB, ISSMGE

University Services

2023–2024	Committee Member	Dean’s Faculty Advisory Council @FSE, ASU
2022–	Committee Member	Laboratory Committee @SSEBE, ASU
2022	Committee Member	Faculty Search Committee @SSEBE, ASU
2022	Panelist	NSF CAREER proposal workshop @SSEBE, ASU
2021	Panelist	NSF CAREER proposal workshop @SSEBE, ASU
2020–	Committee Member	Curriculum Committee @CBBG
2020	Panelist	NSF CAREER proposal writing workshop @FSE, ASU
2019	Faculty representative	Graduation Convocation @ASU
2018–2022	Committee Member	CESE Academic Affairs (Curriculum) Committee of School of Sustainable Engineering and the Built Environment @ASU
2018–	Faculty Volunteer	E2 Camp @ASU
2014–2018	Committee Chair	Computer Committee of Department of Civil Engineering @UAkron
2014–2018	Committee Member	Faculty Research Committee @UAkron
2013–2018	Committee Co-Chair	Seminar Committee of Department of Civil Engineering @UAkron

Professional Committee Service

2017–	Committee Member	Committee on Strategic Planning of International Association of Chinese Infrastructure Professionals (IACIP)
2017–	Chair for Award Sub-committee	Committee on Geotechnics of Soil Erosion of ASCE Geo-Institute

2017–2019	Committee Chair	Committee on Slope Stability and Retaining Structures of World Transport Convention (China)
2016–2019	Committee Member	AFS40 Committee on Subsurface Soil-Structure Interaction of TRB
2016–2019	Committee Member	AFD35 Committee on Bridge Management of TRB
2016–2019	Committee Member	AFD20 Committee on Pavement Monitoring and Evaluation of TRB
2015–	Committee Member	Committee on Engineering Geology and Site Characterization of ASCE Geo-Institute
2015–2018	Committee Member	AFS10 Standing Committee on Transportation Earthworks of TRB
2014–2017	Young Committee Member	AFS60 Standing Committee on Hydrology of TRB
2014	Young Committee Member	AFS40 Committee on Subsurface Soil-Structure Interaction of TRB
2013–2016	Committee Member	AFD35 Committee on Bridge Management of TRB
2013–2016	Young Committee Member	AFD20 Committee on Pavement Monitoring and Evaluation of TRB

PERSONNEL: STUDENT SUPERVISOR/MENTORING, TEACHING, DISSERTATION COMMITTEES, RESEARCHERS, AND OUTREACH

Summary of Mentoring

PostDoc Researchers	2
PhD Students Graduated	6
PhD Students Current	1
MS Students Graduated	14
Undergraduate research Students	24
High-School Research Students	7
Student Fellowships and Awards	20

Summary of Teaching

Undergraduate Courses Taught	5
Graduate Courses Taught	4
Average Undergraduate Teaching Score	4.4
Average Graduate Teaching Score	4.7

Mentoring

PostDoc

2024–	Xiwei Li	ASU	Mangrove + Scour, *Co-advised with Professor Leon van Paassen*,
2021	Sichuan Huang	ASU	Clam + Robot

Ph.D. Students

2021–	Sarina Shahhosseini	ASU	Burrowing Robots
2020–2024	Xiwei Li	ASU	Mangrove + Scour, *Co-advised with Professor Leon van Paassen*
2019–2023	Yi Zhong	ASU	Lizard/Mole +Underground Communication
2018–2023	Yong Tang	ASU	Seed Awn + Burrowing Mechanism
2018–2020	Sichuan Huang	ASU	Clam + Burrowing Mechanism
2014–2018	Junhong Li	UAkron	Bridge Scour
2014–2018	Hui Tao	UAkron	Internal Erosion

M.S. Students

2023	Marilyn Mendoza	ASU	Burrowing Robots
2022–2023	Manthan Rajendra Pai	ASU	Burrowing Robots
2022–2023	Dishika Agrawal	ASU	Burrowing Robots
2021–2023	Md Ragib Shaharear	ASU	Burrowing Robots
2019–2021	Brian Rudolph	ASU	NA, *Co-advised with Professor Claudia Zapata; non-thesis*
2019–2021	Drew Enns	ASU	Mangrove + Scour, *Co-advised with Professor Leon van Paassen*
2019–2020	Joel Ramirez	ASU	Mangrove + Scour, *Co-advised with Professor Leon van Paassen; Student graduated without thesis*
2016–2018	Ganesh Pandey	UAkron	Recycled glass
2015–2018	Sichuan Huang	UAkron	Burrowing Mechanisms
2015–2017	Ruotian Bao	UAkron	MICP
2015–2016	Brendan Patrick Lieske	UAkron	Shale Strength
2015–2016	Goutham Narayan Mopur	UAkron	Peat Stabilization
2014–2016	Jie Hu	UAkron	Energy Harvesting
2013–2014	Candice Fellows	UAkron	Energy Piles, *Co-advised with Professor Robert Liang*

Undergraduate Research Students

2023	Chiran Raj Verma	ASU	Underground Communication, *Electrical Engineering*
2023	Maxime Zand	ASU	Burrowing Robots, *Mechanical Engineering*
2023	Arin Shaw	ASU	Animal Self-burial, *Biology*
2023	Varun Kumar	ASU	Underground Navigation, *Computer Science*
2021–2023	Mohan Parekh	ASU	Burrowing Robots
2021	Ashwin Kumar S	ASU	Burrowing Robots, *SURI, from Easwari Engineering College, India*
2021	Harsh Rajkamal	ASU	Burrowing Robots, *SURI, from Vellore Institute of Technology, India*
2021	Shesha Sai Tushar Kanchipuram	ASU	Burrowing Robots, *SURI, from Biral Institute of Technology and Science, Pilani, India*
2021	Zakary Vladich	ASU	Burrowing Robots, *REU, from Northern Arizona University*
2021	Leslie Bautista and Marilyn Mendoza	ASU	Geo-prediction, *Co-advised with Professors Ed Kavazanjian and Leon van Paassen*
2020–2021	Chung Ting Wong	ASU	Mangrove + Scour, *Co-advised with Professor Leon van Paassen*
2020	Andrew Suarez	ASU	Burrowing Robots, *REU, Veteran*
2019–2021	Alexandria Ardente	ASU	Burrowing Robots, *Mechanical Engineering*
2019	Lindsay Lee	ASU	Burrowing Robots
2019	Amanda Clarke	ASU	Burrowing Robots, *VIP program*
2019	Brandon Grimes	ASU	Burrowing Robots, *VIP program*
2019–2020	Stephen Dages	ASU	Burrowing Robots, *REU, Physics, from West Chester University*
2019	Khem Holden	ASU	Burrowing Robots, *REU, Robotics, from University of California, Sant Cruz*
2019	Hyun Choi	ASU	Burrowing Robots, *REU, Biology*
2019	Makram Jreissat	ASU	Burrowing Robots

2017	Nathaniel Green	UAkron	MICP, *Biology*
2016–2017	Gwen Baker	UAkron	Recycled glass
2015	Daniel Gutwein	UAkron	Energy Harvesting
2014–2015	Matthew Cymbal	UAkron	Underwater Robot

High School Research Students

2024	Ariana Cota	Corona del Sol High School	Bio-inspired Helical Burrowing Robot
2024	Aliya Khan	BASIS Chandler	Bio-inspired Helical Burrowing Robot
2021	Jannette Marti-Subirana	Chandler Preparatory Academy	Burrowing Mechanisms
2017	Sophia Solganik	Shaker Heights High School	DEM simulation
2017	Lillian Gonzalez	Home-schooled	DEM simulation
2016	Nicholas Robinson	Green High School	3D printing
2016	Brandon Leap	Kent High School	3D printing

Visiting Scholars

2019–2020	Yunqi Gao	Hohai University	Seismic wave
2016–2018	Xiangrong Wang	Peking University	MICP
2015–2016	Haichao Li	Heibei University of Technology	Explosive compaction

Served as a Thesis Committee Member for

2022–2023	Saeedeh Naziri	NMSU	NA, *Civil Engineering*
2021	Jasmine Victoria	UC Davis	NA, *Civil Engineering*
2020	Nana Kwame Ofosu	ASU	NA, *Mechanical Engineering*
2019–2023	Thibaut Houette	UAkron	NA, *Biology*
2019	Daehyun Kim	ASU	NA, *Civil Engineering*
2018–2020	Ariana Rupp	UAkron	NA, *Biology*
2017	Baiping Ren	UAkron	NA, *Chemical Engineering*
2017	Bimal Thapa	UAkron	NA, *Civil Engineering*
2017	Krishna Vamshi	UAkron	NA, *Civil Engineering*
2016–2017	Long Chen	UAkron	NA, *Chemical Engineering*
2016	Li Zhao	UAkron	NA, *Civil Engineering*
2016	Behnam Kiani	UAkron	NA, *Civil Engineering*
2016	Tanvir Quasem	UAkron	NA, *Civil Engineering*
2015	Hui Wang	UAkron	NA, *Civil Engineering*
2015	Ayako Yajima	UAkron	NA, *Civil Engineering*
2015	Morteza Vatani	UAkron	NA, *Mechanical Engineering*
2015	Ahmed F. Elghriany	UAkron	NA, *Civil Engineering*
2014	Abbas Rahimi	UAkron	NA, *Mechanical Engineering*
2014	Ali Moradkhany	UAkron	NA, *Civil Engineering*

Student Success

2024	Sarina Shahhosseini	Trent R. Dames and William W. Moore Fellowships, @American Society for Civil Engineers
2024	Sarina Shahhosseini	Student Fellowship, @Arizona Geo-institute
2024	Xiwei Li	Graduate Fellowship, @SSEBE
2023	Sarina Shahhosseini	Graduate Fellowship, @SSEBE
2022	Sarina Shahhosseini	Third Place Outstanding Research Poster Award, @2022 CBBG Mid-Year Meeting
2022	Yi ZHong	Student Leadership Council Travel Stipend, @ASCE Geo-institute

2021	Alexandra Ardentte	FURI scholarship, @ASU Schools of Engineering
2021	Leslie Bautista and Marilyn Mendoza	Geo-prediction Competition Finalist, @ASCE Geo-institute
2021	Yong Tang	Geo-poster Competition Finalist (Top 6), @ASCE Geo-institute
2021	Yi Zhong	Student Scholarship, @Arizona Geo-Instutute
2021	Yi Zhong	Second-place Poster Award, @ASU Annual SSEBE Graduate Research Symposium
2020	Alexandra Ardentte	FURI scholarship, @ASU Schools of Engineering
2020	Sichuan Huang	Second-place Poster Award, @ASU Annual SSEBE Graduate Research Symposium
2019	Sichuan Huang	Outstanding Volunteer Award, @4th CBBG Annual Meeting
2019	Sichuan Huang	Third Place Outstanding Research Poster Award, @4th CBBG Annual Meeting
2019	Sichuan Huang	Third Place in Poster Competition, @ASU Annual SSEBE Graduate Research Symposium
2017	Ruotian Bao and Junhong Li	Excellent Paper Award, @International Conference on Transportation Infrastructure and Materials
2016	Junhong Li	Civil Engineering Department Scholarship Awards, @University of Akron
2016	Sichuan Huang	Software training scholarship, @Itasca Education Partnership (IEP) program
2015	Hui Tao	First Place Award in Poster Competition, @IACIP

Outreach Activities

2023	Volunteer	ASU Homecoming Block Party Science Booth (CBBG)	ASU
2022	Volunteer	ASU Homecoming Block Party Science Booth (CBBG)	ASU
2020	Volunteer	ASU Engineering Open Door	ASU
2019	Volunteer	ASU Homecoming Block Party Science Booth (CBBG)	ASU
2019	Faculty Mentor	REU/RET	ASU CBBG
2019	Volunteer	CompuPower SRE Lab Tours	ASU
2018	Volunteer	ASU RECHARGE Conference	ASU
2018	Volunteer	ASU Engineering Open Door	ASU
2018	Volunteer	ASU Homecoming Block Party Science Booth (CBBG)	ASU
2017	Mentor	High School Summer Research Academy in Engineering	UAkron
2017	Supervisor	Science Olympiad Tournament	Akron, Ohio
2016	Mentor	High School Summer Research Academy in Engineering	UAkron
2016	Judge	Northeastern Ohio STEM Science Fair	Kent State
2015	Speed Mentor	Northeastern Ohio STEM Science Fair	Hudson High
2011	Junior Mentor	Introduce a Girl into Engineering	CWRU

Teaching

At ASU

CEE-452 Foundation Engineering	2024 Spring	30	4.38/5
CEE-598 Foundation Engineering	2024 Spring	3	4/5
CEE-452 Foundation Engineering	2023 Spring	14	4.24/5
CEE-598 Foundation Engineering	2023 Spring	1	3.67/5
CEE-494 Bio-inspired Design	2023 Spring	14	4.78/5
CEE-598 Bio-inspired Design	2023 Spring	4	5/5
CEE-550 Soil Behavior	2022 Fall	6	4.5/5
CEE-452 Foundation Engineering	2022 Spring	29	4.25/5
CEE-598 Foundation Engineering	2022 Spring	2	4.5/5
CEE-550 Soil Behavior	2021 Fall	13	4.6/5
CEE-452 Foundation Engineering	2021 Spring	49	4.52/5

CEE-598 Foundation Engineering	2021 Spring	4	4.5/5
CEE-494 Bio-inspired Design	2021 Spring	14	4.8/5
CEE-598 Bio-inspired Design	2021 Spring	6	5/5
CEE-452 Foundation Engineering	2020 Spring	57	4.45/5
CEE-598 Foundation Engineering	2020 Spring	3	5/5
CEE-550 Soil Behavior	2019 Fall	13	4.82/5
CEE-494 Bio-inspired Design	2019 Spring	13	4.8/5
CEE-598 Bio-inspired Design	2019 Spring	8	4.78/5
CEE-550 Soil Behavior	2018 Fall	10	4.85/5

At UAkron

4300-314 Geotechnical Engineering	2018 Spring	48	NA/5
4300-201 Statics	2017 Fall	60	NA/5
4300-518 Soil and Rock Exploration	2017 Fall	15	NA/5
4300-314 Geotechnical Engineering	2017 Spring	49	3.85/5
4300-694 Fundamental Behaviors of Soil	2017 Spring	7	5/5
4300-201 Statics	2016 Fall	47	4.51/5
4300-518 Soil and Rock Exploration	2016 Fall	12	4.8/5
4300-314 Geotechnical Engineering	2016 Spring	45	4.42/5
4300-694 Fundamental Behaviors of Soil	2016 Spring	5	4.9/5
4300-201 Statics	2015 Fall	60	4.32/5
4300-518 Soil and Rock Exploration	2015 Fall	14	4.68/5
4300-314 Geotechnical Engineering	2015 Spring	67	4.2/5
4300-694 Fundamental Behaviors of Soil	2015 Spring	4	5/5
4300-201 Statics	2014 Fall	60	4.27/5
4300-418 Soil and Rock Exploration	2014 Fall	2	4.43/5
4300-518 Soil and Rock Exploration	2014 Fall	3	4.88/5
4300-314 Geotechnical Engineering	2014 Spring	40	4/5
4300-314 Geotechnical Lab	2014 Spring	5	5/5
4300-201 Statics	2013 Fall	49	4.2/5

RESEARCH SUPPORT

Summary of Research Support

Total amount of all pending proposals	$1,050,000
Total amount of all awards	$18,762,247
Tao’s recognition in all awards	$2,605,460
Total amount of all awards in which Tao is the PI	$1,837,519
Tao’s total award amount received at ASU	$2,103,705

External Funding

2024–2024	PI: Julian Tao. “Soft Robot for Locomotion in Granular Seabed Media”. *US Department of Defense*, *Nou Systems*, *Inc.*. Share: 100%.	$42,043
2020–2025	PI: Edward Kavazanjian; Co-PI: Zapata, C., Saenz, D., Garcia-Pichel, F., Shock, E., Allenby, B., Rittmann, B., Torres, C., Krajmalnik-Brown, R., Delgado, A., Vivoni, E., Neithalath, N., Cadillo-Quiroz, H., Boyer, T., van Paassen, L., Tao, J., Hamdan, N., Savenye, W., Larson, J.. “Engineering Research Center for Bio-Mediated and Bio-Inspired Geotechnics (CBBG)”. *National Science Foundation*. Share: 5%.	$16,444,444

2019–2021	PI: Julian Tao; Co-PI: Daniel Aukes, Hamidreza Marvi. “EAGER SitS: Active Self-Boring Robots that Enable Next Generation Dynamic Underground Wireless Sensing Networks: Fusion of Fast Prototyping, Modeling and Learning”. *National Science Foundation*. Share: 34%.	$316,000
2018–2023	PI: Julian Tao. “CAREER: Integrated Research and Education on Bio-Inspired Burrowing”. *National Science Foundation*. Share: 100%.	$532,000
2018–2018	PI: Savas Kaya; Co-PI: Julian Tao, Munir Nazzal, Yilmaz Sozer and Ala Abbas. “Roadway Kinetic Energy Capture and Conversion”. *The Ohio Department of Transportation*. Share: 20%.	$30,284
2017–2018	PI: Qindan Huang; Co-PI: Julian Tao. “Evaluation of Effective Bridge Deck Repair Maintenance Methods”. *The Ohio Department of Transportation*. Share: 50%.	$50,000
2016–2018	PI: Julian Tao. “Use of Crushed Recycled Glass in the Construction of Local Roadways”. *The Ohio Department of Transportation*. Share: 100%.	$144,160
2016–2017	PI: Julian Tao. “Evaluation of Post Flooding Shoulder Reconditioning”. *The Ohio Department of Transportation*. Share: 100%.	$32,427
2014–2017	PI: Julian Tao; Co-PI: Robert Liang. “Performance Comparison of Abutment and Retaining Wall Drainage Systems”. *The Ohio Department of Transportation*. Share: 80%.	$285,000
2014–2015	PI: Julian Tao; Co-PI: Robert Liang. “Stabilization of Peat Deposits for Roadway Construction and Remediation”. *The Ohio Department of Transportation*. Share: 80%.	$65,889

Internal Funding

2019–	PI: Julian Tao. “Bio-inspired underground communication”. *NSF ERC Center for Bio-mediated and Bio-inspired Geotechnics*. Share: 100%.	$400,000
2019–	PI: Leon van Paassen; Co-PI: Julian Tao. “Bio-based Scour Countermeasures”. *NSF ERC Center for Bio-mediated and Bio-inspired Geotechnics*. Share: 50%.	$400,000
2016–2017	PI: Julian Tao. “Microbial Induced Calcite Precipitation as Erosion and Bridge Scour Countermeasure”. *Summer Faculty Fellowship at The University of Akron*. Share: 100%.	$10,000
2014–2014	PI: Julian Tao; Co-PI: Jiahua Zhu, Gunjin Yun. “Bio-inspired Piezo-electrochromic Full-field Strain Sensing by Multilayered Nanocomposites”. *Biomimicry Research and Innovation Center Initiative Research Incentive Grant at The University of Akron*. Share: 34%.	$10,000