

# Junliang “Julian” Tao

PhD, Associate Professor

## Curriculum Vitae

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## Education

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

## Experiences

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

## Selected awards and honours

2017	CAREER Award, National Science Foundation
2017	Young Engineer of the Year Award, American Society of Civil Engineers, Akron Section

## Professional Membership and Service

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

I have participated in organizing or chairing 20 technical conferences or sessions, served on 12 technical committees, and reviewed for 32 journals, 3 funding agencies. I also volunteered in 14 outreach activities.

## Relevant Publications

Since 2009 I have authored 110 research publications, including 40 journal papers, 65 conference papers, and 5 technical reports, co-edited 3 books, and filed 2 patents. I also have delivered 34 invited talks to universities, local, national and international conferences. As of February 14, 2024, my h-index is 18 and i10-index is 32, with total citations of 1,431. (**Bold**: PhD student, #: undergrad student, \*: corresponding)

1. 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.

2. **S Shahhosseini**<sup>~</sup>, M Parekh<sup>#</sup>, and J Tao<sup>\*</sup>. 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.
3. **Y Zhong**, S Huang<sup>x</sup>, and J Tao<sup>\*</sup>. Minimalistic Horizontal Burrowing Robots. *Journal of Geotechnical and Geoenvironmental Engineering* **149**(4) (2023), 02823001. DOI: 10.1061/JGGEFK.GTENG-11468.
4. **Y Zhong**<sup>~</sup> and J Tao<sup>\*</sup>. 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.
5. **Y Tang** and J Tao<sup>\*</sup>. 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.
6. **Y Zhong** and J Tao<sup>\*</sup>. Bio-Inspired Vibrational Wireless Underground Communication System. *Journal of Rock Mechanics and Geotechnical Engineering* **14** (2022). DOI: 10.1016/j.jrmge.2022.06.005.
7. J Tao. Burrowing Soft Robots Break New Ground. *Science Robotics* **6**(55) (2021). DOI: 10.1126/scirobotics.abj3615.
8. **S Huang**, **Y Tang**, H Bagheri, D Li, A Ardente<sup>#</sup>, D Aukes, H Marvi, and J Tao<sup>\*</sup>. 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.
9. J Tao<sup>\*</sup>, **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.
10. J Tao<sup>\*</sup>, **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.

## Relevant Qualifications, Capabilities, and Experiences

I am the director of the research group Bio-inspired Geotechnics (BiG) in the NSF Research Center for Bio-mediated and Bio-inspired Geotechnics at Arizona State University. 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.

I have secured about \$2M awards as a PI, published over 100 research papers, mentored about 20 graduate students, about 30 undergraduate and high school students, and a number of high-school teachers. Among all my mentees, about 1/3 are from underrepresented groups.

My leadership is demonstrated through organizing the upcoming International Conference on Bio-mediated and Bio-inspired Geotechnics, and co-editing several proceedings and special journal issues in bio-inspired geotechnics.