# Junliang "Julian" Tao

PhD, Associate Professor

**Curriculum Vitae**
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## Education

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| **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

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| 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 |

## Select Honors and Awards

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| 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 |

## 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 interfaces 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

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| 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 INVITED TALKS

Since 2009, I have authored **115** research publications, including **44** journal papers, **66** conference papers, and **5** technical reports, co-edited **3** books, and filed **2** patents. I also have delivered **36** invited talks to universities, local, national and international conferences. As of **January 21, 2025**, my h-index is **19** and i10-index is **34**, with total citations of **1,714**. Only publications on bio-inspired geotechnics are included below.

### Journal Articles on Bio-inspired Geotechnics [1]

### Conference Papers on Bio-inspired Geotechnics [2]

### Patents

[1] **Bold**: PhD student, Underline: MS student, #: undergrad student, ∞: visiting student, ×: PostDoc, *: corresponding
[2] **Bold**: PhD student, Underline: MS student, #: undergrad student, ∞: visiting student, ×: PostDoc, *: corresponding, ~: presentor

### Invited Talks in the Past 3 Years

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| 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 |

## PROFESSIONAL ACTIVITIES AND SERVICE

I served as an Editor or Guest Editor for **3** peer-reviewed journals or journal special issues and currently serving on an Editorial Board for **1** journal. I chaired **2** international/national conferences and **12** conference sessions, reviewed for **32** journals, numerous conferences and multiple funding agencies.
Externally, I served on **12** professional committees; and internally, I also served on **1** university-level committees, **3** Engineering School-level committees and **9** unit-level committees.

### Conference Organization in the Past 3 Years

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| 2025 | Leading Member of Organizing Committee<br>@International Conference on Biomediated and Bioinspired Geotechnics | Tempe, USA |
| 2024 | Co-chair of Technical Committee<br>@GeoShanghai International Conference 2024 (GeoShanghai 2024) | Shanghai, China |
| 2023 | Session Chair of Session on Bioinspired Geotechnics<br>@Engineering Mechanics Institute Conference | Atlanta, GA |
| 2022 | Co-chair of Organizing Committee<br>@ASCE Web Conference on Bio-inspired Geotechnics | Virtial |

### Editorial Services

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| 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 |

## MENTORING AND TEACHING

As of **January, 2025**, I have mentored **2** PostDoc, **6** graduated PhDs, **1** ongoing PhD students, **14** MS students, **24** undergraduate research students, **7** high school researchers, and **2** high school teacher researchers.
I have taught **5** undergraduate-level courses with a mean score of **4.4**/5, and **4** graduate-level courses with a mean score of **4.7**/5.

## RESEARCH SUPPORT

The awards in which Dr. Tao served as an investigator total **$18,762,247**; Dr. Tao’s recognitions in all awards total **$2,605,460**; the total amount of all awards in which Dr. Tao is the leading PI is **$1,837,519**.

### External Funding on Bio-inspired Geotechnics as PI

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| 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 |