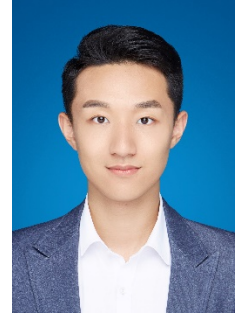


Tianrun Gao



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Nationality China
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Education

Sep. 2022 - Now **Tongji University, Shanghai, China**

- Doctor of Civil Engineering, Tunneling and Underground Engineering
- Supervised by Prof. Hongwei Huang, Email: huanghw@tongji.edu.cn
- Anticipated Graduation: March 2028

Jul. 2021 - Nov. 2021 **University of Toronto, Online Participation due to Covid-19**

- Research Internship
- Funded by *Mitacs Globalink Program*, Canadian Government

Sep. 2018 - Jul. 2022 **Tianjin University, Tianjin, China**

- Bachelor of Engineering, Civil Engineering
- Ranking: 4/130, Weighted Score: 91.5/100

Sep. 2015 - Jul. 2018 **The Experimental High School Attached to Beijing Normal University, Beijing, China**

- High School Diploma

Major professional courses

- Linear Algebra, Advanced Mathematics, Applied Statistics, Stochastic Process, Numerical Analysis, Theoretical Mechanics, Mechanics of Materials, Structural Mechanics, Elastic Mechanics and Finite Element Methods, Plastic Mechanics, Interdisciplinary Frontiers of AI and Physics, Introduction to AI, Soil Mechanics, Rock Mechanics, Tunnel Engineering, etc.

Research interests

- Physics-informed intelligent assessment and control of impact on complex engineering systems.
- Automated numerical modeling and AI for physics simulation & design.
- Experimental and numerical methods for the simulation of tunneling influence.

Academic Contributions

Publications:

- [1] J. Z. Zhang, **T. R. Gao**. Compressibility of Abnormal Pressure Gas Reservoirs and its Effect on Reserves. *ACS omega*, 2021, 6(40): 26221-26230.
- [2] R. Jia, **T. R. Gao**, G. Yang. Analysis on the Influence of Construction Stress Release and Disturbance on Seismic Response of Tunnel. *Chinese Journal of Underground Space and Engineering*, 2022, 18(S2): 916-925.
- [3] H. W. Huang, **T. R. Gao**, D. M. Zhang. A Hybrid Approach for Modifying Tunneling-Induced Response in Existing Multi-Tunnel Environment. *Computers and Geotechnics*, 2025, 179, 106921.
- [4] **T. R. Gao**, D. M. Zhang, J. Z. Zhang, Z. W. Ye, H. W. Huang. Experimental Study on the Influence of Existing Tunnel on Tunneling Disturbance Propagation. *Tunnelling. Underground. Space Technol*, 2024. (*Manuscript ready for submission*)

Conferences:

- [1] **T. R. Gao**, J. W. Jia, X. M. Liu, W. J. Zhang, H. W. Huang. 3D refined numerical simulation analysis of the impact of shield tunnel construction on adjacent pile foundation and soil. 2022 China Tunnel and Underground Engineering Conference (CTUC2022), Changsha, China, 2023. *(Oral Presentation)*
- [2] **T. R. Gao**, D. M. Zhang, H. W. Huang. Study on Predicting Existing Tunnel Settlement Induced by Shield Tunneling Based on Machine Learning. The 2nd Workshop on Future of Machine Learning in Geotechnics and the 5th Machine Learning in Geotechnics Dialogue (2FOMLIG & 5MLIGD), Chengdu, China, 2024. *(Oral Presentation)*
- [3] **T. R. Gao**, D. M. Zhang, X. M. Liu, H. W. Huang. Data-based Risk Evaluation on 4 Overlapped Existing Subway Tunnels Undercrossed by Shield Tunneling. ITA World Tunnel Congress 2025, Stockholm, Sweden, 2025. *(Accept for Oral Presentation)*

Patents:

- [1] Z. X. Chang, X. S. Cheng, H. F. Cheng, **T. R. Gao**, D. Y. Li, R. Z. Wang. A 3D Printing Device for Underground Pipeline Structure Installation. Tianjin, China: CN20212 0691496.7, 2021-11-05. (*Granted Invention Patent*)
- [2] Z. X. Chang, X. S. Cheng, H. F. Cheng, **T. R. Gao**, D. Y. Li, R. Z. Wang. A 3D Printing Device for Underground Pipeline Structure Installation. Tianjin, China: CN202110 367402.5, 2021-07-09. (*Granted Utility Patent*)
- [3] H. W. Huang, J. Z. Zhang, **T. R. Gao**, D. M. Zhang. Experimental Model for Full Cross-Section Deformation Monitoring of Longitudinal and Transverse Tunnels and Post-Processing Algorithm Based on GANs. Shanghai, China, 2024-10-31. (*Invention Patent Officially Accepted for Review*)

Projects

Jan. 2022 - Now

The nonlinear evolution and resilience control of safety and risk of shield tunneling under multiple uncertain environments. National Natural Science Foundation of China (No. 52130805).

Awards and Scholarships

- Top Ten Candidate of the School of Construction Engineering in Tianjin University. (2021, 2022)
- Tianjin University Alumni Scholarship. (2021)
- Outstanding students of Tianjin University. (2019,2020,2021)
- Tianjin Municipal Government Scholarship. (2020)
- Tianjin University Research and Design Institute Scholarship. (2019)

Computer and English Skills

- **Software:**
 - *Proficient with Abaqus (FEM), FLAC^{3D} (FDM), Python, MS Office, Origin, AutoCAD,.*
 - *Familiar with Matlab, PFC^{3D} (DEM), SPH, Rhino.*
- **English Skills:**
 - *TOEFL: 102 (Reading:28, Listening:27, Speaking:23, Writing:24) (Nov. 2020).*
 - *GRE: 324 (Verbar Reasoning:155, Quantitative Reasoning:169, Analytical Writing:3.5) (Aug. 2020).*
 - *Fluent in oral English, with fairly strong reading and writing ability.*

Other information

- Physically fit and passionate about sports, served as a member of Tianjin University Rowing Team winning 1st prize in Tianjin, demonstrating strong sense of responsibility and team spirit.
- Quick-minded with strong communication skills, achieved the University Debate Championship as a member of debate team.
- Easy-going, optimistic, adaptable and resilient.
- Self-motivated, with a passion for learning and the capability to efficiently master new knowledge.