

# Zhiyi Tang

Ph.D., Lecturer  
Kunming University of Science and Technology  
Email: tang@kust.edu.cn  
Web: zhiyitang.info

727 South Jing-ming Rd.  
Cheng-gong District  
Kunming, Yunnan  
650500

## Objective

My research studies structural health monitoring (SHM) for civil infrastructures. I am interested in developing methods that learn structural behavior/performance as inverse problems. Also, I pay close attention to improve monitoring systems' reliability.

## Work / Teaching Experience

Lecturer, Faculty of Civil Engineering and Mechanics  
Kunming University of Science and Technology, Kunming, China  
Dec 2021 – Now

Asia-Pacific-Euro Summer School (APESS) on Smart Structures Technology, Qingdao, China  
Volunteer  
July – Aug 2018

- Curriculum Planning, Daily Life Support, Final Group Project TA  
[https://github.com/dawnnao/APESS2018\\_Steel\\_Girder\\_Crack\\_ID\\_dataset](https://github.com/dawnnao/APESS2018_Steel_Girder_Crack_ID_dataset)
- Manager: Hui Li

Harbin Institute of Technology, Harbin, China  
Teaching Assistant  
Sep – Nov 2016

- Developed course material and assignments for structural health monitoring of civil infrastructure
- Instructors: Hui Li, Yuequan Bao

Tibetan Traditional Medical College, Lahsa, China  
Volunteer Teacher  
Aug 2013 – July 2014

- English Teaching, Non-Profit Public Service Activities
- Manager: Tsering

## Education

Visiting Scholar, Civil Engineering  
Purdue University, West Lafayette, IN, USA  
Oct 2019 – Sep 2020

- Co-advisor: Mohammad Reza Jahanshahi

Ph.D. Student, Engineering Mechanics  
Harbin Institute of Technology, Harbin, China  
Sep 2016 – July 2021

- Advisor: Yuequan Bao

Master of Science, Civil Engineering  
Harbin Institute of Technology, Harbin, China  
Sep 2014 – July 2016

- Thesis: Blind Source Separation of Bridge Multi-Vibration
- Advisor: Hui Li

Bachelor of Science, Theoretical and Applied Mechanics  
Harbin Institute of Technology, Harbin, China  
Sep 2009 – July 2013

- Thesis: Long-Span Bridge Aerodynamic Damping Analysis

- Advisor: Hui Li

## Publications

1. Youqi Zhang, **Zhiyi Tang**, and Ruijing Yang. "Data anomaly detection for structural health monitoring by multi-view representation based on local binary patterns." *Measurement*. 2022.
2. Jingran He, Ruofan Gao, and **Zhiyi Tang**. "A data-driven multi-scale constitutive model of concrete material based on polynomial chaos expansion and stochastic damage model." *Construction and Building Materials*. 2022.
3. Dawei Liu, **Zhiyi Tang**, Yuequan Bao, and Hui Li. "Machine-learning-based methods for output-only structural modal identification." *Structural Control and Health Monitoring*. 2021.
4. **Zhiyi Tang**, Yuequan Bao, and Hui Li. "Group sparsity-aware convolutional neural network for missing data recovery of structural health monitoring." *Structural Health Monitoring*. 2020.
5. Yuequan Bao, **Zhiyi Tang**, and Hui Li. "Compressive-sensing data reconstruction for structural health monitoring: a machine-learning approach". *Structural Health Monitoring*. 2019.
6. **Zhiyi Tang**, Zhicheng Chen, Yuequan Bao, and Hui Li. "Convolutional neural network-based data anomaly detection method using multiple information for structural health monitoring". *Structural Control and Health Monitoring*. 2018.
7. Yuequan Bao, **Zhiyi Tang**, Hui Li, and Yufeng Zhang. "Computer vision and deep learning-based data anomaly detection method for structural health monitoring". *Structural Health Monitoring*. 2018.
8. Zhengliang Xiang, Yuequan Bao, **Zhiyi Tang**, and Hui Li. "Deep reinforcement learning-based sampling method for structural reliability assessment." *Reliability Engineering & System Safety*. 2020.
9. Zhicheng Chen, Yuequan Bao, **Zhiyi Tang**, Jiahui Chen, and Hui Li. "Clarifying and quantifying the geometric correlation for probability distributions of inter-sensor monitoring data: A functional data analytic methodology." *Mechanical Systems and Signal Processing*. 2020.
10. Yuequan Bao, Zhicheng Chen, Shiyin Wei, Yang Xu, **Zhiyi Tang**, and Hui Li. "The State of the Art of Data Science and Engineering in Structural Health Monitoring." *Engineering*. 2019.

## Honors

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|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| - Excellent Doctoral Dissertation of Harbin Institute of Technology (31 over 1000+ yearly)                                                            | 2022        |
| - KUST High-level Talent Introduction Program: 5th level                                                                                              | 2021        |
| - National Scholarship of Ministry of Education (8 over 300+ yearly)                                                                                  | 2019        |
| - 1st Prize Innovation Scholarship of Ministry of Industry and Information Technology                                                                 | 2019        |
| - Excellent paper of WTC 2018 (74 over 1829): "Artificial Intelligence-based Data Anomaly Detection Method for Structural Health Monitoring", Beijing | 2018        |
| - Best Performance Award - 2nd Prize (8 groups) in APESS 2017, Yokohama                                                                               | 2017        |
| - JSTI co. Structural Health Monitoring Graduate Fellowship (3 over 200+ yearly)                                                                      | 2016        |
| - HIT Graduate Scholarship                                                                                                                            | 2014 – 2016 |
| - The Source of Love Scholarship for Volunteers                                                                                                       | 2014        |
| - Excellent Undergraduate Thesis of Harbin Institute of Technology (100 over 6,000+ yearly)                                                           | 2013        |
| - XIANZI ZENG Scholarship for distinguished undergraduates                                                                                            | 2010 – 2013 |
| - HIT Dong Liang Scholarship for top grades undergraduates                                                                                            | 2010        |

## Computer Skills

Python, MATLAB, TensorFlow, PyTorch, L<sup>A</sup>T<sub>E</sub>X, R, ANSYS, JavaScript, HTML, CSS, Linux, Mac

## Academic Activities

- Reviewer for *Structural Health Monitoring, Mechanical Systems and Signal Processing, Automation in Construction, Advanced Engineering Informatics, Measurement, and Sensors*
- ASCE student member, IEEE student member
- Engineering Mechanics Institute Conference 2020, New York (online) 2021
- Engineering Mechanics Institute Conference 2019, Pasadena 2019
- 7th World Conference on Structural Control and Monitoring, Qingdao 2018
- 11th Asia-Pacific-Europe Smart Structures Summer School, Qingdao 2018
- 1st World Transportation Convention, Beijing 2018
- 8th Cross-Strait Workshop on Civil Infrastructure Monitoring and Control, Hangzhou 2017
- 10th Asia-Pacific-Europe Smart Structures Summer School, Yokohama 2017