Xiao Tan, Ph.D.

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Institute of Intelligent Water Conservancy and Intelligent Disaster Reduction
College of Water Conservancy and Hydropower Engineering
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EDUCATION

Ph. D. in Civil Engineering (Structural Engineering)   **GPA: 4.0/4.0**   08/2019–05/2023
    Stevens Institute of Technology, Hoboken, New Jersey, United States   *Advisor: Prof. Yi Bao*
M. S. in Civil Engineering (Bridge & Tunnel Engineering)   **GPA: 3.8/4.0**   09/2016–06/2019
    Southeast University, Nanjing, Jiangsu, China   *Advisor: Prof. Wen-Wei Wang*
B. S. in Civil Engineering (Road, Bridge & River-Crossing Engineering)   **GPA: 3.9/4.0**   09/2012–07/2016
    Chang'an University, Xi'an, Shaanxi, China   *Advisor: Prof. Xiao-Yu Gao*

ACADEMIC EXPERIENCE

Associate Professor	**College of Water Conservancy and Hydropower Engineering**	**Hohai University**	05/2024–Present
Lecturer	**College of Water Conservancy and Hydropower Engineering**	**Hohai University**	01/2024–05/2023
Research Associate	**Smart Infrastructure Lab**	**Stevens Institute of Technology**	12/2022–12/2023
Lab Manager	**Smart Infrastructure Lab**	**Stevens Institute of Technology**	09/2021–04/2023
Research Assistant	**Smart Infrastructure Lab**	**Stevens Institute of Technology**	08/2019–11/2022
Teaching Assistant	**Dept. of Civil, Environmental & Ocean Engineering**	**Stevens Institute of Technology**	09/2020–05/2021
Research Assistant	**Dept. of Bridge Engineering**	**Southeast University**	09/2016–06/2019

RESEARCH INTERESTS

1. **Intelligent and Resilient Water Conveyance Structures**
   Prevention and Mitigation of Impacts on Safety and Functionality of Water Conveyance Pipelines, Tunnels, Aqueducts, Canals, Flumes, etc.
2. **Distributed Fiber Optic Sensors**
   Monitoring and Assessment of Behaviors of Infrastructures Based on Distributed Fiber Optic Sensors
3. *Structural Monitoring and Assessment*
   Structural Health Monitoring, Non-destructive Testing and Evaluation, Structural Retrofits
4. **Structural Applications of Advanced Materials in Civil and Hydraulic Infrastructures**
   Simulation, Mechanical Analysis, and Experimental Testing for High-performance Fiber-Reinforced Cementitious Composites (HPFRCC), Fiber Reinforced Polymer (FRP), and Shape Memory Alloy (SMA)

SELECTED HONORS AND AWARDS

Outstanding Reviewer for 2023	ASCE - Journal of Pipeline Systems Engineering and Practice	05/2024

Best Researcher Award | Engineering	International Conference on Advanced Network Protocols, Technology and Communication Research (ICANPTCR)	12/2023
Richard I. Hires Outstanding Research Award	Stevens Institute of Technology	05/2023
Graduate Research Assistant Fellowship	Stevens Institute of Technology	09/2022
Chinese Government Award for Outstanding Self-Financed Students Abroad	China Scholarship Council (CSC)	08/2022
NSF-sponsored Proposal Writing Workshop Travel Grant	National Science Foundation (NSF)	05/2022
Graduate Conference Funding Award	Stevens Institute of Technology	05/2022
Excellence Doctoral Fellowship	Stevens Institute of Technology	09/2021
Graduate Teaching Assistant Fellowship	Stevens Institute of Technology	09/2020
Provost Doctoral Fellowship	Stevens Institute of Technology	09/2019
Best Poster Award of 21st Annual NJDOT Showcase Poster Competition	New Jersey Department of Transportation (NJDOT)	10/2019
Second Place of National Graduate Mathematical Modeling Contest	Southeast University	10/2017

PROFESSIONAL SOCIETIES AND SERVICES

Editorial Board:	*Editorial Board, ASTM - Journal of Testing and Evaluation* **(SCI; IF: 1.2)**
	Guest Editor, Measurement Science and Technology **(SCI; IF: 2.4)** *- Special Issue: AI-Driven Measurement Methods for Resilient Infrastructure and Communities*
	Guest Editor, Advances in Structural Engineering **(SCI; IF: 2.6)** *- Special Issue: Al-driven Monitoring and Condition Assessment for Enhancing Infrastructure Resilience*
	Guest Editor, ASCE - Practice Periodical on Structural Design and Construction **(ESCI; IF: 1.9)** *- Special Issue: Strengthening Critical Civil Infrastructure: Advancing Resilience in the Face of Climate Change, Urbanization, and Natural Hazards*
	Guest Editor, Journal of Intelligent Construction - Special Issue: Advancements in Structural Health Monitoring and Condition Assessment for Intelligent Urban Lifelines
	Guest Editor, Developments in the Built Environment **(SCI; IF: 8.2)** *- Special Issue: Cutting-Edge Testing and Data Analytics for Constructional Materials*
Peer Reviewer:	*Automation in Construction, Structural Health Monitoring, Mechanical Systems and Signal Processing, Measurement, NDT & E International, Nondestructive Testing and Evaluation, Sustainable Cities and Society, Construction and Building Materials, Journal of Cleaner Production, Composite Structures, Engineering Structures, Structures, Journal of Constructional Steel Research, Transportation Research Record, ASCE - Journal of Bridge Engineering, ASCE - Practice Periodical on Structural Design and Construction, ASCE - Journal of Pipeline Systems Engineering and Practice, Journal of Civil Structural Health Monitoring, Scientific Reports, Signals, Sensors, Journal of Composites Science, Computation, Electronics, Buildings, Infrastructures, NDT, Smart Construction and Sustainable Cities*
Association Members:	*American Society of Civil Engineers (ASCE), American Concrete Institute (ACI), American Society of Mechanical Engineers (ASME), American Academy of Environmental Engineers and Scientists (AAEES), The International Association for Bridge and Structural Engineering (IABSE), The International Federation for Structural Concrete (fib)*

PUBLICATIONS

Google Scholar: https://scholar.google.com/citations?user=m5Ka3gEAAAAJ&hl=en (*h-index: 13*)

Journal Papers (Published or accepted)

[1] **Tan, X.**, Bao, Y.*, Zhang, Q., Nassif, H., and Chen, G., (2021), "Strain transfer effect in distributed fiber optic sensors under an arbitrary field", *Automation in Construction*, 124, p.103597. https://doi.org/10.1016/j.autcon.2021.103597 (**JCR: Q1, IF: 10.3**)

[2] **Tan, X.**, Abu-Obeidah, A., Bao, Y.*; Nassif, N., and Nasreddine, W., (2021), "Measurement and visualization of strains and cracks in CFRP post-tensioned fiber reinforced concrete beams using distributed fiber optic sensors", *Automation in Construction*, 124, p.103604. https://doi.org/10.1016/j.autcon.2021.103604 (**JCR: Q1, IF: 10.3**)

[3] **Tan, X.**, Bao, Y.* (2021), "Measuring crack width using a distributed fiber optic sensor based on optical frequency domain reflectometry", *Measurement: Journal of the International Measurement Confederation*, 172, p.108945. https://doi.org/10.1016/j.measurement.2020.108945 (**JCR: Q1, IF: 5.6**)

[4] **Tan, X.**, Fan, L., Huang, Y. and Bao, Y.* (2021), "Detection, visualization, quantification, and warning of pipeline corrosion using distributed fiber optic sensors", *Automation in Construction*, 132, p.103953. https://doi.org/10.1016/j.autcon.2021.103953 (**JCR: Q1, IF: 10.3**)

[5] **Tan, X.**, Guo, P., Zou, X., and Bao, Y.* (2022), "Buckling detection and shape reconstruction using strain distributions measured from a distributed fiber optic sensor", *Measurement: Journal of the International Measurement Confederation*, 200, p.111625. https://doi.org/10.1016/j.measurement.2022.111625 (**JCR: Q1, IF: 5.6**)

[6] **Tan, X.**, Mahjoubi, S., Zou, X., Meng, W., and Bao, Y.* (2023), "Metaheuristic inverse analysis on interfacial mechanics of distributed fiber optic sensors undergoing interfacial debonding", *Mechanical Systems and Signal Processing*, 200, p.110532. https://doi.org/10.1016/j.ymssp.2023.110532 (**JCR: Q1, IF: 8.4**)

[7] **Tan, X.**, Mahjoubi, S., Zhang, Q., Dong, D. and Bao, Y.* (2022), "A framework for improving bridge resilience and sustainability through optimizing high-performance fiber-reinforced cementitious composites", *Journal of Infrastructure Preservation and Resilience*, 3(1), pp.1-18. https://doi.org/10.1186/s43065-022-00067-0 (**IF: 2.8**)

[8] **Tan, X.**, Poorghasem, S., Huang, Y., Feng, X., and Bao, Y.* (2024), "Monitoring of pipelines subjected to interactive bending and dent using distributed fiber optic sensors", *Automation in Construction*, 160, p.105306. https://doi.org/10.1016/j.autcon.2024.105306 (**JCR: Q1, IF: 10.3**)

[9] **Tan, X.**, Du, J., Zhang, Q., Meng, W., and Bao, Y.* (2024), " Monitoring restrained shrinkage and cracks of ultra-high-performance concrete (UHPC) using distributed fiber optic sensors", *Construction and Building Materials*, 422, p.135789. https://doi.org/10.1016/j.conbuildmat.2024.135789 (**JCR: Q1, IF: 7.4**)

[10] Liu, Y., **Tan, X.**, and Bao, Y.* (2024), "Machine learning-assisted intelligent interpretation of distributed fiber optic sensor data for automated monitoring of pipeline corrosion", *Measurement: Journal of the International Measurement Confederation*, 226, p.114190. https://doi.org/10.1016/j.measurement.2024.114190 (**JCR: Q1, IF: 5.6**)

[11] Du, J., **Tan, X.**, Wang, Y., Bao, Y., and Meng, W. (2024). "Reducing the cracking potential of ultra-high-performance concrete (UHPC) with the prewet expansive agent", *Construction and Building Materials*, 431, p.136597. https://doi.org/10.1016/j.conbuildmat.2024.136597 (**JCR: Q1, IF: 7.4**)

[12] Wu, X., He, J., Tian, J.*, **Tan, X.***, Hu, S., Zheng Y., Wang, W., and Zhang, W., (2023), "Shear behaviors of engineered cementitious composites to seawater sea-sand concrete (ECC-to-SSSC) interfaces cast using 3D-printed pre-grooving formwork: Mechanical properties, characterization, and life-cycle assessment", *Journal of Building Engineering*, 78, p.107636. https://doi.org/10.1016/j.jobe.2023.107636 (**JCR: Q1, IF: 6.4**)

[13] Fan, L., **Tan, X.**, Zhang, Q., Meng, W., Chen, G. and Bao, Y.* (2020), "Monitoring corrosion of steel bars in reinforced concrete based on helix strains measured from a distributed fiber optic sensor", *Engineering Structures*, 204, p.110039. https://doi.org/10.1016/j.engstruct.2019.110039 (**JCR: Q1, IF: 5.5**)

[14] Mahjoubi, S., **Tan, X.**, and Bao, Y.* (2022), "Inverse analysis of strain distribution sensed by distributed fiber optic sensor subject to strain transfer", *Mechanical Systems and Signal Processing*, 166, p.108474. https://doi.org/10.1016/j.ymssp.2021.108474 (**JCR: Q1, IF: 8.4**)

[15] Yan, M., **Tan, X.**, Mahjoubi, S. and Bao, Y.* (2022), "Strain transfer effect on measurements with distributed fiber optic sensors", *Automation in Construction*, 139, p.104262. https://doi.org/10.1016/j.autcon.2022.104262 (**JCR: Q1, IF: 10.3**)

[16] Cao, X., Wang, W.*, **Tan. X.**, Zhang, Y., and Zhou, C.* (2024), "Seismic behaviour of pre-damaged RC columns strengthened with CFRP grid/sprayed ECC jackets subjected to horizontal reversed cyclic loading and constant axial force." *Case Studies in Construction Materials*, 20, p.e02948. https://doi.org/10.1016/j.cscm.2024.e02948 (**JCR: Q1, IF: 6.2**)

[17] Tian, J., Wu, X., **Tan, X.**, Zuo, Y., Zheng, Y., Yuan, J., Wang, W.W., Wei, L. and Zhang, W., (2024), "Feasibility study of smart functional strain-hardening cementitious composites: Self-sensing model and experimental performance", *Construction and Building Materials*, 436, p.136850. https://doi.org/10.1016/j.conbuildmat.2024.136850 (**JCR: Q1, IF: 7.4**)

[18] Tian, J., Wu, X., Yuan, J., **Tan, X.**, Wei, L., Zhang, W., and Yu, P. (2024), "Investigation on shear properties and mechanical model of FRP-ECC-concrete composite interface cast with 3D-printing pre-grooves", *Structures,* 64, p.106582. https://doi.org/10.1016/j.istruc.2024.106582 (**JCR: Q2, IF: 4.1**)

[19] Bai, H., Guo, D., Wang, W., **Tan, X.**, Yan M., Chen, G., and Bao, Y.* (2022), " Experimental investigation on flexural behavior of steel-concrete composite floor slabs with distributed fiber optic sensors", *Journal of Building Engineering*, 54, p.104668. https://doi.org/10.1016/j.jobe.2022.104668 (**JCR: Q1, IF: 6.4**)

[20] Liu, Z., Shi, C., Shi, Q., **Tan, X.**, and Meng, W.* (2022), "Recycling waste glass aggregate in concrete: Mitigation of alkali-silica reaction (ASR) by carbonation curing", *Journal of Cleaner Production*, 370, p.133545. https://doi.org/10.1016/j.jclepro.2022.133545 (**JCR: Q1, IF: 11.1**)

[21] Xue, Y., Wang, W.*, **Tan, X.**, Hui, Y., Tian, J. and Zhu, Z. (2022), "Mechanical behavior and recoverable properties of CFRP shape memory alloy composite under different initial strains", *Construction and Building Materials*, 333, p.127186. https://doi.org/10.1016/j.conbuildmat.2022.127186 (**JCR: Q1, IF: 7.4**)

[22] Tian, J., Wu, X.*, **Tan, X.**, Wang, W. *, Hu, S., Du, Y., Yuan, J., Huang, W. and Huang, X. (2022), "Experimental study and analysis model of flexural synergistic effect of reinforced concrete beams strengthened with ECC", *Construction and Building Materials*, 352, p.128987. https://doi.org/10.1016/j.conbuildmat.2022.128987 (**JCR: Q1, IF: 7.4**)

[23] Tian, J., Wu, X.*, Wang, W.*, Hu, S., **Tan, X.**, Du, Y., Zheng, Y. and Sun, C. (2022), "Experimental study and mechanics model of ECC-to-concrete bond interface under tensile loading." *Composite Structures*, 285, p.115203. https://doi.org/10.1016/j.compstruct.2022.115203 (**JCR: Q1, IF: 6.3**)

[24] Zhu, Z., Wang, W.*, Zheng, Y., Tian, J., and **Tan, X.** (2019), "The constitutive model of FRP/ECC composite materials under uniaxial cyclic tensile loading based on the digital image correlation technique", *China Civil Engineering Journal*, 52(10), pp.36-45, https://doi.org/10.15951/j.tmgcxb.2019.10.003 (**EI**)

[25] Hui, Y., Xue, Y., Wang, W.*, **Tan, X.**, (2022), "Experimental study on mechanical properties and recoverability of FRP/SMA composites", *Acta Materiae Compositae Sinica*, 2023(9), pp.1-15. https://doi.org/10.13801/j.cnki.fhclxb.20221206.002 (**EI**)

Journal Papers (Under review)

[26] **Tan, X.**, Liu, Y., and Bao, Y.*, "Automated monitoring and assessment of interactive anomalies for pipelines: A review", *Automation in Construction*, Elsevier. (**JCR: Q1, IF: 10.3**)

[27] **Tan, X.**, Liu, Y., and Bao, Y.*, "Assessment and discrimination of pipeline corrosion interacted with dents using distributed fiber optic sensors", *Measurement*, Elsevier. (**JCR: Q1, IF: 5.6**)

[28] **Tan, X.**, Poorghasem, S., and Bao, Y.*, " A multi-fidelity approach of combining point and distributed strain sensor for complementary data-fusion of mechanical interactive anomalies", *Measurement*, Elsevier. (**JCR: Q1, IF: 5.6**)

[29] **Tan, X.**, and Bao, Y.*, "Mechanical analysis, prediction and elimination restrained shrinkage induced cracking of the HPFRCC rings based on distributed fiber optic sensing data", *Cement and Concrete Composites*, Elsevier. (**JCR: Q1, IF: 10.5**)

CONFERENCE AND PRESENTATION

[1] **Tan, X.**, and Bao, Y.*(2019), "Improving bridge performance using fiber reinforced polymer (FRP), shape memory alloy (SMA) and engineered cementitious composite (ECC)", *In: 21st Annual NJDOT Research Showcase,* New Jersey Department of Transportation (NJDOT). https://www.njdottechtransfer.net/wp-content/uploads/2019/10/01b-NJDOT-Presentation-Xiao-Tan-10222019.pdf

[2] **Tan, X.**, Xu, L., Huang, Y. and Bao, Y.*, (2020), "Distributed fiber optic sensor network (DFOS) for real-time monitoring of pipeline interactive anomalies", *2020 Pipeline Research & Development: Meetings - Forums*, Pipeline and Hazardous Materials Safety Administration (PHMSA), U.S. Department of Transportation. https://primis.phmsa.dot.gov/rd/mtgs/021920/Stevens%20Institute%20of%20Technology.pdf

[3] **Tan, X.**, Meng, W., Bao, Y.*, Nassif H. and Li, V. C., (2021), " Material redundancy for enhancing the resistance to collapse of the Florida International University (FIU) Bridge", *2021 TRB Annual Meeting*, Transportation Research Board. https://trid.trb.org/view/1759138

[4] **Tan, X.**, and Bao, Y.*(2021), "Achieving resilient and smart concrete bridges by mapping strains and cracks using distributed fiber optic sensors", *23rd Annual NJDOT Research Showcase - Breakout Session for Infrastructure*, New Jersey Department of Transportation (NJDOT). https://www.njdottechtransfer.net/wp-content/uploads/2021/10/Presentation-Xiao-Tan-Infrastructure.pdf; https://www.youtube.com/watch?v=28icJnyrK2w

[5] **Tan, X.**, and Bao, Y.*(2022), "Crack detection, location, quantification, and visualization using a distributed fiber optic sensor based on optical frequency domain reflectometry", *Engineering Mechanics Institute (EMI) Conference 2022*, ASCE Engineering Mechanics Institute. https://www.emi-conference.org/sites/emi-conference.org/2022/files/inline-files/Technical%20Program_V10.pdf

[6] **Tan, X.**, Meng, W., and Bao, Y.*(2022), " Improving Bridge Resilience and Sustainability Through Optimizing High-Performance Fiber-Reinforced Cementitious Composites ", *TriDurLE 2022 symposium*, National Center for Transportation Infrastructure Durability & Life-Extension (TriDurLE). https://s3.wp.wsu.edu/uploads/sites/2442/2022/11/Symposium-Schedule-Matrix.pdf; https://www.youtube.com/watch?v=MgU1UrygLmQ

RESEARCH PROJECT

[1] **Distributed Fiber Optic Sensor Network for Real-time Monitoring of Pipeline Interactive Anomalies** (U.S. DOT PHMSA 693JK31950008CAAP, 2019-2023)
https://primis.phmsa.dot.gov/matrix/PrjHome.rdm?prj=841

[2] **Consecutive Assembly-and-Mineralization Processed Calcium-Silicate-Hydrate Nacre with High Specific Flexural Strength and Fracture Toughness** (National Science Foundation CMMI CAREER 2046407, 2020-2025)
https://www.nsf.gov/awardsearch/showAward?AWD_ID=2046407

[3] **Intelligent Corrosion Mitigation System of Steel Structures with Duplex Coating** (National Science Foundation CMMI CAREER 1750316, 2020-2025)
https://www.nsf.gov/awardsearch/showAward?AWD_ID=1750316

[4] **Thermal-mechanical properties and pre-stress activation mechanism of FRP/SMA Composites** (National Natural Science Foundation of China NSFC-51878156, 2019-2022)

[5] **Research on the confined mechanism and restoring force model of earthquake-damaged concrete pier strengthened with FRP grid and sprayed ECC** (National Natural Science Foundation of China NSFC-51578135, 2016-2019)

PATENT

[1] Wang, W., **Tan, X.**, Zhou C., Qi S., Zhang, W., Chen, L., Hu, W., and Chen, X. (2019), "A tensile equipment and the corresponding operation method for shape memory alloy wires", *Patent for Invention, Patent number ZL201910163900.0*, China National Intellectual Property Administration.