Curriculum Vitae of FU Yuguang

Assistant Professor
School of Civil and Environmental Engineering,
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Summary
Dr. Fu's research has been primarily in the areas of smart sensing & diagnostic technologies, advanced modelling & simulation techniques, and their applications in infrastructure monitoring and digital construction. Prof. Fu has published 70+ journal papers and holds/files 6 patents. He participated in several critical projects as PI, co-PI or key personnel, funded by NASA, NSF, FRA (in the USA), NSFC (in China), and MOE, PUB, AI Singapore (in Singapore). He acted as the key personnel for next-gen wireless smart sensor development and enabled the world's largest wireless sensor network in Ain Dubai Ferris Wheel for construction monitoring, with nearly 200 nodes. He developed a smart IoT system, commercialized it via the support of NSF-SBIR, and successfully deployed it on over 10 railroad bridges in North America. He also coordinated the development of a multi-physics cyber-physical testbed to enable unprecedented testing of resilient strategies of deep space infrastructure at scale, and the achievement has been reported by WSJ.

Education
University of Illinois at Urbana-Champaign, USA
Ph.D. in Civil Engineering, Sept. 2019
Tongji University, China
Bachelor-Master Joint Program in Civil Engineering, July. 2014

Professional Experience
Assistant Professor, Nanyang Technological University, Aug. 2021-present
Cluster Director in IoT sensing, Energy Research Institute @ NTU, Jul. 2025-present
CEE Chair Search Committee, CoE, NTU, Sep 2025-present
Global Young Faculty Search Taskforce Committee, College of Engineering, NTU, Oct. 2024-present
BEng (ICM) Taskforce Committee, CEE, NTU, Sep. 2024-present
MSc (Civil Engineering) Program Director, NTU, Jul. 2023-present
NTU-CEE Seminar Committee Member, NTU, Feb. 2023-present
Postdoctoral Research Associate, Purdue University, Dec. 2019-Jul.2021
Research Scientist, Embedor Technologies, Jul.2019-Dec.2019
Associate Editor, *Journal of Civil Structural Health Monitoring* (Springer), Oct. 2025-present
Associate Editor, *Frontiers in Built Environment* (Frontiers), Sep. 2023-present
Editorial Board Member, *Scientific Reports* (Springer), Oct. 2025-present
Editorial Board Member, *Journal of Resilient Cities and Structure* (Elsevier), Feb. 2025-present
Early Career Editorial Board Member, *ASCE-ASME Journal for Risk and Uncertainty in Engineering Systems* (ASCE), Jul. 2025-present.
Early Career Editor, *Urban Lifeline* (Springer), Dec. 2024-present
Early Career Editor, *Smart Construction* (ELSP), Dec. 2024-present
Early Career Editor, *Earthquake Engineering and Resilience* (Wiley), May. 2022-present
Invited Journal Reviewers: Nature Communications, Mechanical Systems and Signal Processing, Automation in Construction, Computer-aided Civil and Infrastructure Engineering, Engineering Applications of Artificial Intelligence, Advanced Engineering Informatics, Structural Control and Health Monitoring, Reliability Engineering & Systems Safety, Journal of Engineering Mechanics, Engineering Structures, Structural Health Monitoring, Measurement, Information fusion, etc.
Invited Grant Reviewers: Ministry of Education AcRF Tier 1, Enterprise Singapore EDG, Building and Construction Authority BETA, etc.

Professional Memberships

President-elect, Singapore Section, *American Society of Civil Engineers*, 2025-Present.
Member, EMI-SHMC Committee and EMI-Dynamics Committee, *American Society of Civil Engineers*, 2023-Present.
Secretary of Young Member Committee, *International Society for Structural Health Monitoring of Intelligent Infrastructure*, 2025-Present.
Early Career Researchers Committee Member, *International Society for Structural Health Monitoring of Intelligent Infrastructure*, 2022-Present.
Student Liaison Officer, *Institution of Engineers Singapore-The Institution of Structural Engineers Joint Committee*, 2022-Present.

Awards, Honors and Scholarships

1. Best Paper Award (1st Place), SHMII-13 conference, Graz, Austria, 2025
2. Young Faculty Award (Special Mention), CoE, Nanyang Technological University, 2025.
3. First Prize, Innovation and Entrepreneurship Competition, Jiangsu, China, 2022.
4. Editor's Choice Journal Article, Sensors journal, 2021.
5. Second Prize, 1st International Project Competition for Structural Health Monitoring, 2020.
6. Best Student Paper Award (3rd Place), ASCE EMI conference, Caltech, 2019.
7. LIU Huixian Earthquake Engineering Scholarship Award, 2018
8. Mavis Future Faculty Fellow, UIUC, 2017
9. YEE Fellowship Award, College of Engineering, UIUC, 2017
10. List of Teachers Ranked as Excellent by Their Students, UIUC, 2016
11. National Scholarship, Ministry of Education, China (Top 2%), 2009,2010,2013
12. Bayer-Tongji Sustainability Development Chair Scholarship (Top 2%), 2013
13. Best Student Paper Award (2nd Place), National Civil Engineering Forum, China, 2012
14. First Prize, ASCE Mid-Pacific Student Conference, UC Berkeley, 2012

Editorships of Special Issues

1. Leading Guest Editor, "Advanced Structural Health Monitoring using Smart Sensing and Artificial Intelligence", *Engineering Structures*, 2025.
2. Leading Guest Editor, "Advances in Bayesian Inference for Structural Health Monitoring", *ASCE-ASME Journal for Risk and Uncertainty in Engineering Systems*, 2025.
3. Guest Editor, "Toward Resilient Intelligent Structural Systems in Earthquake Engineering", *Reliability Engineering and System Safety*, 2025.
4. Leading Guest Editor, "Digital twin technologies and applications for structural health monitoring", *Frontiers in Built Environment*, 2024.
5. Leading Guest Editor, "Smart Sensing and Artificial Intelligence for Civil Infrastructure Monitoring and Management", *Sensors*, 2023.
6. Guest Editor, "Recent Advances in Structural Health Monitoring and Maintenance of Buildings", *Buildings*, 2023.

Selected Journal Publications (* corresponding author)

1. Yu, X., **Fu, Y.***, Shen, W., Liang, R., Fan, H., Han, C., Yang, Y. "Edge intelligence-based acoustic trigger sensing for real-time monitoring of train-crossing events", *Measurement*, accepted.
2. Zhang, Z., Mondal, T.G., Yang, X., **Fu, Y.*** "Automated non-contact geometric quality assessment of building elements integrating mixed reality, depth sensing, and vision foundation model", *Journal of Computing in Civil Engineering*, accepted.
3. Yu, X., Dan, D., **Fu, Y***, Xu, Z. "Mechanics-Guided Neural Network Surrogate Model for Cable Force Identification", *Structural Health Monitoring*, accepted.
4. Wang, Y., **Fu, Y.***, Tong, L.*, "Multi-objective Design Framework under Uncertainties for Strengthening Tubular Truss by Partially Filling with Grout", *Frontiers of Structural and Civil Engineering*, accepted.

5. Chang, X., Zhang, Y., Han, C., **Fu, Y.***, Mao, J., Wang, H. (2026) "Structural Evaluation of Cracked Shield Tunnels Using Computer-Vision-Based Model Updating Techniques", *Advanced Engineering Informatics*, 69, 103818.
6. Han, C., He, X., Wang, Z., **Fu, Y.*** (2025) "A Self-Adaptive Physics-Informed Neural Network for Real-time Prediction of Structural Damage", *Mechanical Systems and Signal Processing*, 239, 113322.
7. Fan, H., Li, L., **Fu, Y.***, Liu, H., Chang, X., Gao, X. (2025). "Block Collapse Prediction and Reinforcement Optimization in Tunnels Based on Discontinuous Deformation Analysis and Machine Learning Models". *International Journal for Numerical and Analytical Methods in Geomechanics*.
8. Zhang, Q., **Fu, Y***. (2025) "SFD-ResTrack: Object Trajectory Extraction Framework for Traffic Investigations in Rainy Conditions", *Signal, Image and Video Processing*, 19,1134.
9. Fu, H., Deng, L.*, Tang, B., Cui, S., **Fu, Y.*** (2025). "Ultra-low memory spatiotemporal decomposition recurrent neural networks for edge structural fault monitoring", *Applied Soft Computing*, 113777.
10. Lin, Y., **Fu, Y.**, Sun, J., Xie, R., He, X.* (2025) "Robust seismic response evaluation considering an uncertainty emerging in asymmetric bridges", *Reliability Engineering & System Safety*, 266, 111740.
11. Fan, H., Li, L., **Fu Y.***, Chang, X. (2025). "3D DDA-MPM coupling method for fluid-solid interaction: Theory, validation and application in tunnels", *Computers and Geotechnics*,187, 107523.
12. Jin, Z., **Fu, Y.***, Sun, Z. (2025). "Time-Frequency Balanced Data Reconstruction for SHM based on Wavelet-Enhanced Multi-scale Residual Convolutional Block and Frequency Distribution Loss", *Mechanical Systems and Signal Processing*, 237, 113127.
13. Yu, X., Zhao, Y., Cui, S., He, X., **Fu, Y.***, Yang, Q. (2025). "Efficient edge intelligence for onboard data anomaly classification in wireless structural health monitoring using knowledge distillation on low-cost IoT nodes", *Structural Health Monitoring*, 14759217251349533.
14. Yang, Q., Yu, X., **Fu, Y.*** (2025). "Attention-based encoder for online data anomaly classification in multivariate time series". *Journal of Computing in Civil Engineering*, 39 (6), 04025094.
15. Cao, Y., Jin, Z., **Fu, Y.*** (2025). "A new hybrid inference model for human performance reliability prediction: a case study of construction workers", *Smart Construction*, 2(3).
16. Han, C., Dong, Y., Qu, S., Dong, L., Zhao, C., Madan, A., **Fu, Y.**, Yang, Y.* (2025). "A Semi-Supervised Diffusion-Based Paradigm for Vehicle-Track System Health Monitoring with Distributed Acoustic Sensing." *IEEE Transactions on Intelligent Transportation Systems*.
17. Du, Z., Yang, Y., Zhu, H.*, Yang, J., Han, M., **Fu, Y**. (2025). "Design optimization of inclined pile permeable breakwater based on a CFD-SVR-WO framework." *Ocean Engineering*, *338*, 121948.
18. Zhang, Z., **Fu, Y.**, Sun, Z*. (2025). "Advancements in digital twin-enhanced health monitoring and condition assessment of cable-supported bridges". *Structures*, 79, 109448.
19. Mou, B., Chen, H., **Fu, Y.*** "An Effective Design Method of High-strength Steel Columns with Limited Datasets using Physics-guided Conditional Tabular GAN". *Engineering Structures*, 340, 120597.
20. Chang, X., Zhang, R., Mao, J., **Fu, Y.***, Fan, H., Wang, H. "Modeling and Quantitative Assessment of Critical Defects in Shield Tunnels with Cascading Effects". *Geotechnical and Geological Engineering*, 43(5), 1-20.
21. Zhang, F., **Fu, Y.***, Shen, K., Zhang, Y., Wang, J. (2025). "Distributed edge intelligence for structural dynamic response estimation using knowledge distillation and data fusion". *Engineering Structures*, 335, 120406.
22. Fu, H., Deng, L., Tang, B.*, Cui, S., **Fu, Y.** (2025). Neural Networks Micro Memory Control Strategy for Mechanical Faults Edge Recognition. *IEEE Transactions on Industrial Informatics*.
23. Mou, B., Li, Q., Zhang, Z., **Fu, Y.*** (2025) "A reliable and accurate design method for high-strength steel bolted built-up columns enhanced by synthetic data augmentation with data-driven models". *Structures*, 76, 109043.

24. Wang, S., Moon, S., **Fu, Y.***, Kim, J.* (2025) "Construction regulatory document digitalization with layout knowledge-informed object detection and semantic text recognition". *Advanced Engineering Informatics*, *65*, 103278.
25. Shen, W., **Fu, Y.***, He, X., Zhang, F. (2025). "Multi-band spectral-temporal deep learning network for structural dynamic data forecasting aided by signal decomposition and bandpass filtering". *Advanced Engineering Informatics*, *65*, 103204.
26. Zhao, X., Shao, X., Cao, J., **Fu, Y***. (2025). "Numerical and theoretical studies on the shear behavior of composite beams with a steel-UHPC composite web". *Engineering Structures*, *329*, 119815.
27. Dong, Y., Yang, Y.*, Han, C., Zhao, C., Madan, A., Mohanty, L., **Fu, Y**. (2025). "Heterogeneous graph attention network for rail fastener looseness detection using distributed acoustic sensing and accelerometer data fusion." *Automation in Construction*, *172*, 106051.
28. Mou, B., Lang, X., **Fu, Y***. (2025). "Automated prediction and design of PBL connectors using physics-integrated explainable machine learning and user-friendly web API". *Structures*,73, 108459.
29. Cui, S., Hoang, T., Mechitov, K., **Fu, Y.***, Spencer Jr, B. F. (2025). "Adaptive edge intelligence for rapid structural condition assessment using a wireless smart sensor network." *Engineering Structures*, *326*, 119520.
30. **Fu, Y.***, Wang, Z., Maghareh, A., Dyke, S., Jahanshahi, M., Shahriar, A., Zhang, F. (2025) "Effective structural impact detection and localization using convolutional neural network and Bayesian information fusion with limited sensors". *Mechanical System and Signal Processing*. 224, 112074.
31. Shen, W., **Fu, Y.***, Kong, Q., Li, J. Y. (2025). "Noise-robust automated sudden damage detection using blind source separation enhanced by variational mode decomposition and support vector machine based on shapelet transform". *Journal of Sound and Vibration*, 595, 118783.
32. Zhang, Q., **Fu, Y.*** (2025). "Effective traffic density recognition based on ResNet-SSD with feature fusion and attention mechanism in normal intersection scenes". *Expert Systems with Applications*, 261, 125508.
33. Zhao, X., Shao, X., Cao, J., **Fu, Y***. (2025). "Numerical and theoretical studies on the shear behavior of composite beams with a steel-UHPC composite web". *Engineering Structures*, *329*, 119815.
34. Azimi M., Lund A., **Fu Y**., Montoya H., Vaccino L., Krishnan R.M., Rhee S., Chebbo L., Shariar A., Wang Z., Maghareh A., Dyke S.* (2025). "HabSim: A modular coupled virtual testbed for simulating ExtraTerrestrial habitat systems". *AIAA Journal*, 1-13.
35. Zhao, X., Shao, X., **Fu, Y.**, Cao, J. (2025). "Experimental studies on shear behavior of steel-UHPC composite beams with hot-rolled steel members". *Engineering Structures*, *343*, 121002.
36. Zhang, F., **Fu, Y.***, Wang, J. (2024). "Rapid and automated seismic design of cable restrainer for simply supported bridges crossing fault rupture zones using explainable machine learning". *Soil Dynamics and Earthquake Engineering*, 187, 109011.
37. Ma, T., **Fu, Y.*** (2024). "A multi-sensor fused incremental detection model for blade crack with cross-attention mechanism and Dempster-Shafer evidence theory." *Advanced Engineering Informatics*, *62*, 102952.
38. Liang, R., Liu, W, **Fu, Y.***, Ma, M. (2024). "Physics-informed deep learning for structural dynamics under moving load". *International Journal of Mechanical Sciences*, 109766.
39. Han, C., Wang, Z., **Fu, Y.***, Dyke, S., S.hahriar, A. (2024). "Transfer-AE: A novel Autoencoder-based Impact Detection Model for Structural Digital Twin". *Applied Soft Computing*, 112174.
40. Xu, Y*., Chen, Z., **Fu, Y.**, Wu, L., Huang, K. (2024). "Study on the Enhancement Effect and Design Method of Grouted Screw Anchors in Mucky Soils". *International Journal of Geomechanics*, 24(11), 04024247.
41. Xie, Z., Zhou, Z., He, X., **Fu, Y.**, Gu, J., Zhang, J. (2024). "Methodology for Object-Level Change Detection in Post-Earthquake Building Damage Assessment Based on Remote Sensing Images: OCD-BDA." *Remote Sensing*, *16*(22), 4263.
42. Mao, J., Su, X., Gui, G., Wang, H., **Fu, Y.**, Li, D. (2024). "ResNet transfer learning for accurate and efficient anomaly detection of bridge vibration data". *Smart Structures and Systems*, *34*(6), 415.

43. Zhao, X., Shao, X.*, Cao, X., Cao, J., **Fu, Y**. (2024). "Experimental and analytical investigations into flexural behavior of composite beams with UHPC T-section and HRS H-section". *Engineering Structures*, *315*, 118445.
44. Han, C., Wang, S., Madan, A., Zhao, C., Mohanty, L., **Fu, Y.**, Shen, W., Liang, R., Huang, E.S., Zheng, T., Ong, P.K., Woon, K., Wong, K., Yang, Y.* (2024). "Intelligent detection of loose fasteners in railway tracks using distributed acoustic sensing and machine learning", *Engineering Applications of Artificial Intelligence*, 134, 108684.
45. Chang, X., Zhang, R., Mao, J., **Fu, Y.*** (2024). "Digital Twins in Transportation Infrastructure: An Investigation of the Key Enabling Technologies, Applications, and Challenges". *IEEE Transactions on Intelligent Transportation Systems*.
46. Jian, X., Lai, Z.*, Bacsa, K., **Fu, Y.**, Koh, C.G., Sun, L., Wieser, A., Chatzi, E. (2024) "A robotic automated solution for operational modal analysis of bridges with high-resolution mode shape recovery", *Journal of Structural Engineering*. 150(8), 04024081.
47. Du, L., Zhang, R. and **Fu, Y.*** (2024) "A robust evaluating strategy of tunnel deterioration using ensemble machine learning algorithms". *Engineering Applications of Artificial Intelligence*, *133*, p.108364.
48. Gomez, F., **Fu, Y.***, Hoang, T., Mechitov, K. and Spencer Jr, B.F. (2024). "Estimation of Dynamic Interstory Drift in Buildings Using Wireless Smart Sensors", *Journal of Structural Engineering*, 150(6), p.04024044.
49. Xu, Y.*, **Fu, Y.**, Chen, Z., Qin, R., Wang, L. and Wang, X. (2024) "Experimental study and design formula of the uplift performance of screw anchor foundations in silty clays". *Acta Geotechnica*, 1-12.
50. Yu, X., **Fu, Y.***, Li, J., Mao, J., Hoang, T. and Wang, H. (2023) "Recent advances in wireless sensor networks for structural health monitoring of civil infrastructure." *Journal of Infrastructure Intelligence and Resilience*, p.100066.
51. Mondal, T.G., Zhou, J., **Fu, Y.***, Mao, J. (2023) "A hybrid deep neural network compression approach enabling edge intelligence for data anomaly detection in smart structural health monitoring systems", *Smart Structures and Systems*, 32(3):179.
52. Zheng, Y., Zhang W.*, Zhang C., **Fu, Y.**, Shi, J., Du, X. (2023) "Quasi-static cyclic loading experiment and analysis of mechanical properties of the Sc-FS", *Soil Dynamics and Earthquake Engineering*, 174, 108146.
53. Ni, Y., Mao, J., Wang, H.*, **Fu, Y.**, Zhuo, X. (2023) "Corroded and loosened bolt detection of steel bolted joint based on improved you only look once network and line segment detector", *Smart Structures and Systems*, 32(1), 23-25.
54. Laflamme, S., Ubertini, F., Di Matteo, A., Pirrotta, A., Perry, M., **Fu, Y.**, Li, J., Wang, H., Hoang, T., Glisic, B. and Bond, L.J., (2023). "Roadmap on Measurement Technologies for Next Generation Structural Health Monitoring Systems", *Measurement Science and Technology*.
55. Ni, Y., Mao, J., **Fu, Y.**, Wang, H.*, Zong, H., Luo, K. (2023) "Damage Detection and Localization of Bridge Deck Pavement Based on Deep Learning", *Sensors*, 23(11), 5138.
56. **Fu, Y.**, Zhu, Y.*, Hoang, T., Mechitov, K. and Spencer, B.F. (2022) "xImpact: Intelligent Wireless System for Cost-Effective Rapid Condition Assessment of Bridges under Impacts", *Sensors*, 22(15), 5701.
57. Chou, J.Y. **Fu, Y.**, Huang, S.K.*, Chang, C.M. (2022) "SHM Data Anomaly Classification Using Machine Learning Strategies: A Comparative Study", *Smart Structures and Systems*, 29(1), 77-91.
58. **Fu, Y.***, Hoang, T., Mechitov, K., Spencer Jr, B.F. (2021) "xShake: Intelligent Wireless System for Cost- effective Real-time Seismic Monitoring", *Smart Structures and Systems*, 28 (4), 483-497.
59. **Fu, Y.**, Mechitov, K., Hoang, T., Kim, J.R., Memon, S.A., Spencer Jr, B.F.* (2020). "Efficient and High-precision Time Synchronization for Wireless Monitoring of Civil Infrastructure Subjected to Sudden Events", *Structural Control and Health Monitoring*, e 2643.
60. Hoang, T., **Fu, Y.**, Mechitov, K., Gomez, F., Spencer Jr, B.F.* (2020) "Autonomous End-to-end Wireless Monitoring System for Railroad Bridges", *Advances in Bridge Engineering*, 1(1), 1-27.

61. Maghareh, A.*, **Fu, Y.**, Montoya H., Wang, Z., Dyke, S. (2020). "A Reflective Framework for Performance Management of Real-time Hybrid Simulation", *Frontiers in Built Environment*, 6, 159.
62. Veluthedath, S.A., Chow, R., Mechitov, K., **Fu, Y.**, Hoang, T., Spencer, B.F.* (2020). "Development of synchronized high-sensitivity Wireless accelerometer for structural health monitoring". *Sensors*, 20(15), 4169.
63. **Fu, Y.**, Peng, C., Gomez, F., Narazaki, Y., Spencer Jr, B.F.* (2019). "Sensor Fault Management Techniques for Wireless Smart Sensor Networks in Structural Health Monitoring", *Structural Control and Health Monitoring*, 26(7), e2362.
64. Mao, J.X., Wang, H.*, **Fu, Y.**, Spencer Jr, B.F. (2019). "Automated modal identification using principal component and cluster analysis: Application to a long-span cable-stayed bridge". *Structural Control and Health Monitoring*, 26(10), e2430.
65. **Fu, Y.**, Mechitov, K., Hoang, T., Kim, J.R., Lee, D., Spencer Jr, B.F.* (2019). "Development and Full-scale Validation of High-fidelity Data Acquisition on a Next-generation Wireless Smart Sensor Platform", *Advances in Structural Engineering*, 22(16), 3512-3533.
66. **Fu, Y.***, Hoang, T., Mechitov, K., Spencer Jr, B.F., Kim, J. (2018). "Sudden Event Monitoring of Civil Infrastructure using Demand-based Wireless Smart Sensors", *Sensors*, 18(12), 4480.
67. Zhu, L., **Fu, Y.**, Chow, R., Spencer Jr, B.F.*, Park, J.W., Mechitov, K. (2018). "Development of a High- Sensitivity Wireless Accelerometer for Structural Health Monitoring." *Sensors*, 18(1), 262.
68. **Fu, Y.**, Tong, L.*, He, L., Zhao, X.L. (2016). "Experimental and Numerical Investigation on Behavior of CFRP-Strengthened Circular Hollow Section Gap K-Joints." *Thin-Walled Structures*, 102, 80-97.
69. **Fu, Y.**, Tong, L.*, Liu, B. (2016). "Research on Detection of Fatigue Crack Propagation of Steel Structures Based on Beach Marking Technique." *Engineering Mechanics*, 33(8), 93-100.
70. Tong, L., **Fu, Y.**, Liu, Y., Zhao, X.L.* (2014). "Stress Concentration Factors of Diamond Bird-beak SHS T-joints under Brace Loading." *Thin-Walled Structures*, 74, 201-212.
71. Huang, S.*, **Fu, Y.** (2014). "Study of Seismic Characteristic of Chuan-Dou Style (or Column and Tie Joint) Wood Frame House." *Structural Engineers*, 30(1), 107-112.
72. **Fu, Y.***, Wang, M., Ge, H., Li, L. (2012). "Experimental Study of Mechanical Properties of Bamboo's Joints under Tension and Compression Load." *Advanced Materials Research*, 450-451, 749-755.

Patents Granted/Filed

1. **Fu, Y.**, Cui, S., Yu X., Yu X. "Adaptive Triggering Mechanism for Time-Series Data Sensing on Edge Devices", Singapore provisional patent, 10202502426R, filed Aug 26th, 2025.
2. **Fu, Y.**, Yu, X., Cui, S. "An Adaptive Self-Diagnosis Mechanism for System-Centric Sensor Faults in Wireless IoT-Based Structural Health Monitoring Systems", Singapore provisional patent, 10202500862P, filed Apr 24th, 2025.
3. **Fu, Y.**, Tong, L., Zhou, H. "A Design Method for FRP-Strengthened Circular Hollow K-joints". Invention Patent in China, ZL 201510174183.3, issued August 2nd, 2017.
4. **Fu, Y.**, Shao, B., Fu, S., Chen, S., Wang, P. "Bamboo-Cable Composite Structural Members". Invention Patent in China, ZL 201310161674.5, issued May 13th, 2015.
5. Shao, B., **Fu, Y.**, Fu, S., Chen, S., He, X. "Sleeve-Gypsum Bamboo Joints". Invention Patent in China, ZL 201310166059.3, issued January 21st, 2015.
6. **Fu, Y.**, Wang, M., Li, L., Ge, H. "Sleeve-Cement Bamboo Joints". Utility Patent in China, ZL 201220095107.5, issued December 5th, 2012.

Organized Workshop/Mini Symposium

1. Organizing Committee Member, 14th Asia-Pacific-Euro Summer School on Smart Structures Technology, Hong Kong, China, Jul 14 - Aug 1, 2025.

2. Session Chair, Mini-symposium, "Smart Sensing and Artificial Intelligence for Advanced Civil Infrastructure Monitoring and Management", ASCE-EMI Annual Conference, Anaheim, CA, May 27-30, 2025.
3. Scientific Committee Member, Program Committee Member, and Session Chair, 13th International Conference on Structural Health Monitoring of Intelligent Infrastructure, Graz, Austria, Sep 1-5, 2025.
4. International Scientific Committee Member, International Conference on Advances in Steel Structures (ICASS 2025) cum 4th International Symposium on Industrialized Construction Technology (ISICT 2025), Singapore, Dec 9-12, 2025.
5. **Co-Chair**, 9th International Colloquium on Performance, Protection & Strengthening of Structures Under Extreme Loading & Events (PROTECT2024), Singapore, Aug 13-16, 2024.
6. Technical Committee Member, World Transportation Convention, Qingdao, June 26-29, 2024.
7. Session Chair, Mini-symposium, "Smart IoT sensors and artificial intelligence for civil infrastructure monitoring", ASCE-EMI Annual Conference, Chicago, IL, May 28-Jun 1, 2024.
8. Session Chair, Mini-symposium, "Smart sensing and artificial intelligence for civil infrastructure monitoring", ASCE-EMI Annual Conference, Georgia Tech, Atlanta, GA, June 6-9, 2023.

Selected Conference Proceedings

1. Cui, S., Yu, X., **Fu, Y.***(2025) "Smart Adaptive Triggering Strategy for Edge Intelligence Enabled Energy-efficient Sensing", SHMII-13, Graz, Austria. (**Best Paper Award, 1st Place**).
2. Yu, X., Cui, S., **Fu, Y.***(2025) "Adaptive edge intelligence for system-centric sensor fault diagnosis in wireless IoT-based structural health monitoring system", EMI, Anaheim, CA, USA.
3. Liang, R., Fu, Y.* (2025) "Interpretable deep learning for railroad health monitoring using accelerometers and distributed acoustic sensing", IWSHM, Stanford, USA.
4. Yu, X., **Fu, Y.***, Liang, R. (2025) "Audio-triggered sensing with edge computing for train-crossing events monitoring", 2nd International Symposium on Urban Lifeline., Saitama, Japan.
5. Cui, S., Yu, X., **Fu, Y.*** (2025) "Smart adaptive triggering strategy for edge intelligence enabled energy-efficient sensing", Graz, Austria.
6. Liang, R., **Fu, Y.*** (2025) "Railway anomaly detection using semi-supervised learning based on long-term field vibration monitoring", Singapore.
7. Cui, S., Shen, W., Fu, H., **Fu. Y.*** (2024) "Edge intelligence in smart wireless IoT network for rapid structural damage detection", PROTECT2024, Singapore.
8. Shen, W., Cui, S., **Fu, Y.*** (2024). "Edge intelligence for smart IoT-based structural health monitoring system", Proc. 13th ANCRiSST, Kyoto, Japan.
9. Zhang, F., **Fu, Y.***, Wang, J. (2024) "Distributed edge intelligence for structural seismic response prediction", WCEE2024, Milan, Italy.
10. Yu, X., Zhao, Y., Cui, S., **Fu, Y.*** (2024). "A hybrid deep learning framework enabling edge intelligence for data anomaly detection in smart structural health monitoring systems", EMI/PMC2024, Chicago, IL, USA.
11. Chang, X., Zhang, Y., Fu, Y. (2024) "A Computer-vision-based Model Updating Strategy for Crack Simulation of Shield Tunnels", WTC2024, Shenzhen, China.
12. Yang, Q., Shen, W., **Fu, Y.*** (2023). "Graph Neural Network-based Structural Damage Detection", SHMII-12, Hangzhou, China.
13. Zhang, R., Du L., Shen, W., **Fu, Y.*** (2023). "A Novel Tunnel Deterioration Assessment Model Utilizing Artificial Intelligence Methods", SHMII-12, Hangzhou, China.
14. **Fu, Y.**, Wang, Z., Maghareh, A., Dyke, S., Jahanshahi, M., Shahriar, A. (2023). "Impact Detection and Localization Using Deep Learning and Information Fusion", EMI, Atlanta.
15. Cui, S.W., **Fu, Y.** (2023). "Prototyping of An Edge-Intelligence-Enabled Smart Adaptive Triggering Mechanism for Wireless Vibration-based Structural Health Monitoring", EMI, Atlanta.
16. **Fu, Y.**, Wang, Z., Maghareh, A., Dyke, S., Jahanshahi, M., Shahriar, A. (2021). "Scalable Impact Detection and Localization Using Deep Learning and Information Fusion", IWSHM, Stanford.

17. Zhang, X., **Fu, Y.***, Sharma, S., Dyke, S. (2021). "Auto-tuning Bayesian Filtering for Model Identification and Updating Using Reinforcement Learning", *ACAM10*, Adelaide, Australia.
18. **Fu, Y.**, Hoang, T., Mechitov, K., Spencer Jr, B.F. (2021). "Rapid Condition Assessment of Bridges under Impacts: from System Design to Decision Making", *ASCE-EMI*, New York, NY, USA.
19. **Fu, Y.**, Hoang, T., Mechitov, K.A., Kim, J., Spencer Jr, B.F. (2019). "An Intelligent Wireless System for Real-time Seismic Monitoring of Civil Infrastructure", IWSHM, Stanford, CA, USA.
20. **Fu, Y.**, Hoang, T., Mechitov, K.A., Spencer Jr, B.F. (2019). "Real-time Wireless Data Acquisition Framework for Structural Health Monitoring", *Proc. 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure*, St. Louis, MO, USA.
21. **Fu, Y.**, Hoang, T., Mechitov, K.A., Spencer Jr, B.F. (2019). "An Intelligent Wireless Monitoring System for Real-Time Condition Assessment of Civil Infrastructures", *ASCE-EMI*, Caltech, CA.
22. **Fu, Y.**, Gomez, F., Spencer Jr, B.F. (2018). "Instability Monitoring of Space Grid Structures under Blizzards", *Proc. 7th World Conference on Structural Control and Monitoring*, Qingdao, China.
23. **Fu, Y.**, Hoang, T., Mechitov, K., Spencer Jr, B.F. (2018). "Demand-based Wireless Smart Sensors Enabling Sudden Event Monitoring of Civil Infrastructure", *ASCE-EMI*, Boston, MA, USA.
24. **Fu, Y.**, Zhu, L., Hoang, T., Mechitov, K., Spencer Jr, B.F. (2018). "Demand-based Wireless Smart Sensors for Earthquake Monitoring of Civil Infrastructure", *SPIE Smart Structures/NDE*, Denver.
25. **Fu, Y.**, Zhu, L., Park, J.W., Spencer Jr, B.F. (2017). "Earthquake Monitoring of Civil Infrastructure using Wireless Smart Sensors", Proc. 3rd HIFEE, Urbana, IL, USA.
26. **Fu, Y.**, Peng, C., Park, J.W., Spencer Jr, B.F. (2017). "Fault Detection and Classification for Wireless Sensor Network using Full-scale Monitoring Data", ASCE-EMI, San Diego, CA, USA.
27. Peng, C., **Fu, Y.**, Spencer Jr, B.F. (2017). "Sensor Fault Detection, Identification, and Recovery Techniques for Wireless Sensor Networks: A Full-scale Study", Proc. 13th ANCRiSST, Tokyo, Japan.
28. **Fu, Y.**, Mechitov, K.A., Hoskere, V., Spencer Jr, B.F. (2016). "Development of RTOS-based wireless SHM system: benefits in applications." Proc. International Conference on Smart Infrastructure and Construction, Cambridge, UK.
29. **Fu, Y.**, Tong L. (2015). "Experimental Study on Behavior of CFRP-Strengthened Circular Hollow Section Gap K-Joints." Proc. 6AESE/11ANCRiSST, Champaign, IL, USA.
30. **Fu, Y.**, Hu, L., Hu, Y., He, X., (2014). "Study on the Innovative Application of Bamboo-Cable Composite Structures." XXV International Union of Architects World Congress, Durban, South Africa.
31. **Fu, Y.**, Shao, B., Fu, S. (2013). "Comparative Study of Mechanical Performance of Bamboo Joints." Proc. World Congress on Advances in Structural Engineering and Mechanics, Jeju, South Korea.
32. **Fu, Y.**, Tong, L. (2013). "Application of Beach Marking Method in the Detection of Fatigue Crack Propagation." Proc. 26th KKHTCNN Symposium on Civil Engineering, Singapore.

Recent Research Grants

PI, *Smart Continuous Monitoring System for Coastal Infrastructure Based on Distributed FOS and Wireless IoT Technologies*, S$1,697,000, PUB, Oct. 2025-Sep. 2028.

PI, *SmartBee: Self-Deployable AIoT for Scalable Mobile Sensing*, S$50,000, COE Dean Interdisciplinary Grant, Apr. 2025-Mar. 2026.

Co-PI, *Smart and multifunctional floating structures for coastal protection and flood control*, S$ 2,480,000, *Coastal Protection and Flooding Control Institute*, Sep. 2024-Aug. 2028.

PI, *Human digital twin prototype of industrial worker under heat exposure in climate change and post-pandemic era*, S$160,000, Ministry of Education Tier 1 Generic, Mar. 2024 - Feb. 2026.

PI, *Integrating Computer Vision and Natural Language Processing for Construction Project Document Digitalisation*, S$90,000, Ministry of Education Tier 1 Generic, Mar. 2023 - Mar. 2025.

PI, *Developing a learning analytics model to facilitate adaptive blended learning*, S$25,040, NTU EdeX Grants, Oct. 2022 - Mar. 2024.

PI, *A smart digital twin framework using advanced modelling and data analytics for monitoring and management of underground transportation infrastructure*, S$100,000, Ministry of Education Tier 1 Seed Fund, Jan. 2022 - Dec. 2024.
PI, *Edge Intelligence Enabling Smart IoT Networks for Autonomous Long-term Monitoring of Civil Infrastructure*, S$100,000, Ministry of Education Tier 1 Generic, Jan. 2022 - Jun. 2024.
PI, *Artificial Intelligence of Things Framework for Smart Sensing and Diagnostics of Civil Infrastructure*, S$275,000, NTU Start-up Grant, Jan. 2022 - Jun. 2024.
PI, *A novel framework for occupant comfort and building energy management to accelerate decarbonization*, S$12,000, Imperial-NTU collaboration seed fund, Sept. 2021- Sept. 2023.
Co-PI, *Novel context-aware multivariate time series modelling for underground transportation infrastructure monitoring and management*, S$2,968,800, AI Singapore, May. 2022 - Apr. 2025.
Key Personnel, *Resilient ExtraTerrestrial Habitats Institute*, National Aeronautics and Space Administration, $15,000,000, Sept. 2019 - Aug.2024.
Co-PI, *SBIR Phase I: Smart IoT System for Rapid Condition Assessment of Bridges under Sudden Events*, National Science Foundation, $224,700, July. 2019 - April.2020.
Key Personnel, Condition *Assessment of Railroad Bridges using Wireless Smart Sensors*, Federal Railroad Administration, $335,400, Oct. 2016 - June. 2019.
Key Personnel, *Rare Event Detection and Rapid Condition Assessment using Wireless Smart Sensors*, ZJU-UIUC Institute Research Program, $75,000, Mar. 2017 - Mar.2018.

Invited Talks

1. "Edge Intelligence for Strucutral Health Monitoring: System Development and Benefits in Applications", ETH Zürich, Aug 2025.
2. "AI-assisted Design and Retrofit of Steel Structures", Swiss Federal Technology Institute of Lausanne, Aug 2025.
3. "Structural Anomaly Detection of Ageing Infrastructure with Vibration-based Structural Health Monitoring", *Institute of Engineers, Singapore (IES)*, Engineering Resilient Structures Seminar, One Farrer Hotel, Singapore, July 2025
4. "AI-powered Digital Twin for Structural Health Monitoring", *University of Hong Kong*, July 2025.
5. "Structural Anomaly Detection using Edge Intelligence on Vibration-based IoT Sensing", *ASCE-EMI Dynamics Committee Seminar*, online, March 2025.
6. "Next-generation Structural Health Monitoring System Based on Edge Intelligence (AIoT for SHM)", *Smart Construction journal*, online, December 2024.
7. "Smart IoT System with Edge Intelligence for Intelligent Infrastructure", *Faculty of Engineering, University of Tokyo*, Tokyo, Japan, July 2024.
8. "Smart IoT System with Edge Intelligence for Intelligent Infrastructure", *School of Civil Engineering*, Southwest Jiaotong University, Chengdu, China, July 2024.
9. "Smart IoT System with Edge Intelligence for Intelligent Infrastructure", *IoT Thrust, Information Hub, Hong Kong University of Science and Technology*, Guangzhou, China, April 2024.
10. "Smart IoT System with Edge Intelligence for Intelligent Infrastructure", *School of Civil and Transportation Engineering*, Shenzhen University, Shenzhen, China, April 2024.
11. "Rapid Condition Assessment of Civil Infrastructures using Smart IoT System and Edge Intelligence", *School of Civil and Environmental Engineering, Georgia Institute of Technology*, Atlanta, June 2023.
12. "Building Safe and Disaster - Intelligent & Resilient Infrastructure", *Civil Service College,* Singapore, June 2023.
13. "Rapid Condition Assessment of Structures using Edge Intelligence", *School of Civil Engineering and Transportation, South China University of Technology*, Guangzhou, May 2023.

14. "Rapid Damage Assessment of Structures Using Smart IoT Systems and Edge Intelligence", One Day Workshop on Maintenance of Concrete Structures – Durability Assessment, Repair, New NDT Method Introduction, AI & i-Construction Application in Japan, *NTU*, Mar 2022.
15. "System of Systems Modeling and Testbed for Development of Resilient Deep Space Habitats", *School of Civil Engineering, Tianjin University*, Tianjin, Nov 2021.
16. "Intelligent Infrastructure: Enabling Resilient Built Environment under Multiple Hazards", *School of Civil Engineering, Harbin Institute of Technology*, Shenzhen, Nov 2021.
17. "Intelligent Infrastructure: Enabling Sustainable Built Environment under Multiple Hazards", *School of Civil and Environmental Engineering, NTU*, Singapore, Dec 2020.
18. "Smart IoT System: Enabling Intelligent Infrastructure under multiple hazards", *School of Civil Engineering, Tianjin University*, Tianjin, China, Nov 2020.
19. "Smart IoT System for Sustainable Civil Infrastructure Management under hazard events", *Lyles School of Civil Engineering, Purdue University*, West Lafayette, IN, Oct 2020.
20. "Smart IoT System for Rapid Condition Assessment of Bridges under Sudden Events", *Illinois Center for Transportation, University of Illinois at Urbana-Champaign*, Champaign, IL, Nov 2019.
21. "Intelligent Wireless Monitoring Systems for Rapid Condition Assessment under Sudden Events", *Dept. Civil, Environmental & Architectural Engineering, University of Kansas*, KS, Aug 2019.
22. "Demand-based Wireless Smart Sensors for Sudden Event Monitoring of Civil Infrastructure", *College of Civil Engineering & Architecture*, *Zhejiang University*, Hangzhou, China, June 2018.