TEXAS STATE VITA

I. Academic/Professional Background

A. Name: Yongsheng Bai Title: Post-doctoral Research Fellow

B. Educational Background

Degree	*Year*	*Major*	*University*	*Thesis/Dissertation*
Ph.D.	2022	Civil Engineering	Ohio State University, USA	Deep learning with vision-based technologies for structural damage detection and health monitoring
M.S.	2003	Structural Engineering	Southeast University, China	Design methods for steel-concrete composite beams
B.E.	2000	Civil Engineering	Wuhan University, China	-

C. University Experience

Position	*University*	*Dates*
Lecturer	Texas State University	2025-present
Post-doc	Texas State University	2024-present
Graduate Teaching/Research Assistant	The Ohio State University	2019-2022

D. Relevant Professional Experience

Position	*Entity*	*Dates*
Research Scientist	Neural Image Corporation in Bellevue, WA	2022-2024
Structural Engineer	Shandong Tongyuan Design Group Ltd. in China	2003-2018

II. TEACHING

A. Teaching Honors and Awards

None.

B. Courses Taught

Statics (Texas State University, 2025)

A course covering the theory of engineering mechanics. Topics include forces, moments, and couples acting on stationary engineering structures. Additionally, two- and three-dimensional equilibrium, free body diagrams, friction, centroids, centers of gravity, and moments of inertia are covered.

C. Courses Assisted

Reinforced Concrete Design (Ohio State University, 2019-2022)

The class is designed to teach undergraduate students about how to use codes like ACI 18 to design concrete members. This will help students understand that concrete is naturally strong in compression but weak and brittle in tension, so reinforcing steel (rebar) is strategically placed to carry the tensile forces to prevent catastrophic structural failure.

Steel Structure Design (Ohio State University, 2019)

This is a class intended to teach students about how to use the knowledge of structural steel for the design. Structural steel is a widely used material in Civil Engineering for its high strength in both tension and compression. This allows steel structures to span long distances, reach immense heights, and be constructed with remarkable speed.

D. Directed Student Learning

Theses Indirectly Supervised:

Completed:

- Development of Machine Learning Models for Surface Distress Detection to Evaluate Pavement Sections in Coastal Regions, *Carlos Sanchez* (2025)

Ongoing:

- *Efficient Annotation Workflows for Pavement Distress Segmentation on Multi-modal Images,* Amirhossein Azadi (2026)
- *Comparative Evaluation of YOLOv9 and RT-DETR for Pavement Distress Detection: Inland, Coastal, and Comprehensive Dataset Benchmarks for Asphalt and Rigid Pavement Surfaces,* Rupesh Simkhada (2026)

III. SCHOLARLY/CREATIVE

A. Works in Print (including works accepted, forthcoming, in press)

1. Publications and Presentations

- **Y. Bai**, and F. Wang. Cascaded workflow of automated pavement crack detection and quantification using segmentation AI models. 37th RPUG Annual Conference. Pittsburgh, Pennsylvania, April 28 – May 1, 2026.
- W. Tao , J. Tesic, **Y. Bai**, and F. Wang. Bounding-box to segmentation labeling for pavement distresses using a closed-loop platform on 2D/3D images. 37th RPUG Annual Conference. Pittsburgh, Pennsylvania, April 28 – May 1, 2026.
- Azadi, W. Tao, **Y. Bai**, and F. Wang. Development of workflows for pavement distress segmentation using 2D intensity and 3D range images. 37th RPUG Annual Conference. Pittsburgh, Pennsylvania, April 28 – May 1, 2026.
- Türer, **Y. Bai**, H. Sezen, and A. Yilmaz. Automated post-earthquake structural damage assessment of concrete buildings using a hybrid deep learning and rule-based framework on image datasets [J]. Infrastructure Intelligence and Resilience. 2026, 5(2).
- **Y. Bai**, H. Sezen, A. Yilmaz, and R Qin. Field monitoring and assessment of reinforced concrete building collapse using remote sensing and digital twins[J]. Journal of Civil Structural Health Monitoring, 2026, 16 (2), 21.
- **Y. Bai**, F. Wang, H. Gong, and X. Luo. Evaluation of deep learning strategies using two different image datasets for automated pavement distress detection methodology. United States. The 105th Annual TRB Meeting, Washington, DC, January 5-9, 2026.
- Sanchez, F. Wang, and **Y. Bai**. Harnessing deep learning models for asphalt pavement surface distress detection in coastal regions. United States. The 105th Annual TRB Meeting, Washington, DC, January 5-9, 2026.
- X. Luo, A. Pokharel, F. Wang, and **Y. Bai**. Analyzing pavement conditions before and after coastal natural disasters using historical pavement management system data. United States. The 105th Annual TRB Meeting, Washington, DC, January 5-9, 2026.
- Türer, **Y. Bai**, H. Sezen, and A. Yilmaz. Deep learning-based automated damage detection in concrete structures using images from earthquake events. The 2025 World Congress on Advances in Structural Engineering and Mechanics. Boshan, South Korea. 2025.
- **Y. Bai** and F. Wang. Cascaded workflow for automated pavement crack detection and measurement using generative AI models and image processing techniques. 36th RPUG Annual Conference. Dallas, Texas, April 28 – May 1, 2025.
- Sanchez, F. Wang, **Y. Bai**, and H. Gong. Detection of flexible pavement surface cracks in coastal regions using deep learning and 2D/3D images[J]. Sensors, 2025, 25(4): 1145.
- **Y. Bai**, H. Sezen, A. Yilmaz, and R. Qin. Detection of Cracking and Spalling Damage in Buildings and Bridges. 2024, DesignSafe-CI.

- **Y. Bai**, A. Demir, A. Yilmaz, and H. Sezen. Assessment and monitoring of bridges using various camera placements and structural analysis[J]. Journal of Civil Structural Health Monitoring, 2024, 14(2): 321-337.
- **Y. Bai**, H. Sezen, A. Yilmaz, and R. Qin. Bridge vibration measurements using different camera placements and techniques of computer vision and deep learning[J]. Advances in bridge engineering, 2023, 4(1): 25.
- **Y. Bai**, B. Zha, H. Sezen, and A. Yilmaz. Engineering deep learning methods on automatic detection of damage in infrastructure due to extreme events[J]. Structural Health Monitoring, 2023, 22(1): 338-352.
- **Y. Bai**. Deep learning with vision-based technologies for structural damage detection and health monitoring[M]. The Ohio State University, 2022.
- **Y. Bai**, H. Sezen, and A. Yilmaz. End-to-end deep learning methods for automated damage detection in extreme events at various scales[C]//2020 25th International Conference on Pattern Recognition (ICPR). IEEE, 2021: 6640-6647.
- **Y. Bai**, R.M. Abduallah, H. Sezen, and A. Yilmaz. Automatic displacement and vibration measurement in laboratory experiments with a deep learning method[C]//2021 IEEE Sensors. IEEE, 2021: 1-4.
- **Y. Bai**, H. Sezen, and A. Yilmaz. Detecting cracks and spalling automatically in extreme events by end-to-end deep learning frameworks[J]. ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 2021, 2: 161-168.
- **Y. Bai**, B. Zha, H. Sezen, and A. Yilmaz. Deep cascaded neural networks for automatic detection of structural damage and cracks from images[J]. ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 2020, 2: 411-417.
- B., Zha, **Y., Bai**, A. Yilmaz, and H. Sezen. Deep convolutional neural networks for comprehensive structural health monitoring and damage detection[C]//12th International Workshop on Structural Health Monitoring. 2019.
- **Y. Bai**, B. Zha, J. Wei, A. Yilmaz, and H. Sezen. Predicting earthquake time with neural network and other machine learning methods, 2019, Presentation of the 2019 Eastern Section-SSA Annual Meeting.

B. Works not in Print

1. Publications and Presentations
   - **Y. Bai**, F. Wang, Gong, H., and X. Luo. Evaluation of deep learning strategies using two different image datasets for automated pavement distress detection methodology. Transportation Research Record [J]. 2026. (Accepted).
   - C. Sanchez, **Y. Bai**, F. Wang, and X. Luo. Harnessing deep learning models for asphalt pavement surface distress detection in coastal regions. Transportation Research Record [J]. 2026. (Accepted).
   - A. Azadi, R. Simkhada, **Y. Bai**, and F. Wang. Pavement surface type classification using multi-modal images with machine learning and deep learning models. International Journal of Pavement Research and Technology [J]. 2026. (Accepted).
2. Books
   - **Y. Bai**, H. Sezen, and A. Yilmaz, A chapter, “Vision-based technologies and deep learning methods for assessment and monitoring of buildings and bridges”, for Artificial Intelligence in Concrete Structures and Technologies: Concepts, Models, and Applications. Spring Nature. (2026).

C. Research Awards

- Won third place in UC Berkeley sponsored PEER Hub ImageNet (PHI) Challenge, 2018.

D. Research Projects
1. NSF funded "Using Artificial Intelligence to improve the accuracy of automated pavement condition data collection" (grant No. 2213694), $250k, 2022 to 2024, main researcher.
2. NSF funded "Field testing of concrete buildings and collapse assessment (CMMI-2036193)", $ 270k, 2019 to 2024, major researcher.
3. NSF Non-Academic Research Internships for Graduate Students (INTERN) Supplemental Funding Opportunity, $50k, 2022.
4. TxDOT funded "Artificial Intelligence for pavement condition assessment from 2D/3D surface images" (Project No. 0-7150-1), $499.92k, 2026 to 2028, Co-PI.

IV. SERVICE

A. Professional Development Activities
- Attended Road Profile Users' Group (RPUG) Conference in Pittsburgh, Pennsylvania, 2026.
- Attended Transportation Research Board (TRB) Conference in Washington D.C., 2026.
- Attended Road Profile Users' Group (RPUG) Conference in Denton, Texas, 2025.
- Attended 2020 25th International Conference on Pattern Recognition (ICPR) in Milan, Italy, 2021.
- Attended Eastern Section of the Seismological Society of America (ES-SSA) in Columbus, Ohio, 2019.
- Member of American Society of Civil Engineering (ASCE).
- Member of American Concrete Institute (ACI).

B. Service Activities
1. Reviewer for top-tier journals.
2. Early Career Editorial Board (ECEB) member of Journal of Building Engineering.
3. Member of doctoral and/or master's committees at Texas State, 2026-present

C. Professional:
- Professional License (P.E.), Structural Engineering, China.
- Professional License (P.E.), Geotechnical Engineering, China.
- Professional License (P.E.), Structural Engineering, Texas.