

Zixiang Tong

Ph.D. student, Research Assistant

Department of Aerospace Engineering and Engineering Mechanics
Cockrell School of Engineering
The University of Texas at Austin
2617 Wichita St, Austin, TX, 78712

EDUCATION

The University of Texas at Austin	Engineering Mechanics	Ph.D.	2023 – present
Southeast University	Solid Mechanics	M.S.	2020 – 2023
Southeast University	Engineering Mechanics	B.Eng.	2016 – 2020

ACADEMIC POSITIONS

Research Assistant, The University of Texas at Austin August 2023 – present
Department of Aerospace Engineering and Engineering Mechanics

Teaching Assistant, The University of Texas at Austin August 2023 – present
Department of Aerospace Engineering and Engineering Mechanics

RESEARCH TOPICS

- Full-field measurements: digital image correlation (DIC), digital volume correlation (DVC)
 - Experimental mechanics: machine learning & data-driven based material characterization
 - Computer vision: vision measurement techniques development
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RESEARCH EXPERIENCES

Development of Digital Image/Volume Correlation (DIC/DVC) Algorithms UT-Austin
Advisor: Dr. Jin Yang 2023 - Present

- A new, fast, accurate and adaptive mesh stereo-DIC algorithm, 3D stereo augment Lagrangian DIC (3D stereo-ALDIC) method, is developed to measure the full-field three-dimensional deformation under extreme conditions, which takes advantages of both local stereo-DIC (fast and parallel computing) and global stereo-DIC (accurate and kinematic compatibility).
- A machine learning-aided spatial adaptation method is developed to improve DIC accuracy under complex geometry conditions.

Metamaterial Characterization UT-Austin
Advisors: Dr. Jin Yang 2023 - Present

- Soft elastic resin metamaterial models were made via 3D printing to mimic the alveolar architecture in various sizes.
- Rigorous uniaxial tension, compression, shear rheometry tests at varying loading rates were performed to characterize the metamaterial under different conditions.

Underwater Defect Detection via DIC

Southeast University

Advisors: Dr. Xinxing Shao

2020-2023

- An underwater stereo vision algorithm was developed to eliminate the effects of refraction for underwater structural defect detection.
- An underwater robot equipped with a multi-camera vision system was designed to monitor and repair underwater defects in the dam in real time.

In vivo biokinematic measurements of humans

Southeast University

Advisor: Dr. Xinxing Shao

2016-2020

- A four-camera DIC system was designed to measure the shape and deformation of the skin at the biceps brachii of a volunteer in vivo during arm wrestling.
- A continuous four-camera DIC system was established to measure surface strain of the skin on the back of the hand during grasping process, and then through the connection between skin, joints, bones and muscles, the regular pattern of muscle deformation could be known indirectly.

PUBLICATIONS

Symbol: †: co-first author.

- [12] Joseph Kirchhoff, Dingcheng Luo, **Zixiang Tong**, Jin Yang, Thomas O'Leary Roseberry, and Omar Ghattas. Unveiling Heterogenous Moduli Fields using Digital Image Correlation, Finite Elements and Neural Operators. *18th U.S. National congress on computational mechanics (USNCCM) Conference*, 2025.
- [11] **Zixiang Tong**, Dan Forkin, Hongyang Shi, Trace LaRue, Manuel Rausch, Jin Yang. 3D Stereo Adaptive Mesh Augmented Lagrangian Digital Image Correlation. *Submitted to Experimental Mechanics*. Under review.
- [10] **Zixiang Tong†**, Jeffrey Leu†, Andrew Doty, Solon Tsimpoukis, Jin Yang. Machine Learning-Aided Spatial Adaptation for Improved Digital Image Correlation Analysis of Complex Geometries (†: equal contributions). *Submitted to Strain*. Under review.
- [9] Jin Yang, Alexander McGhee, **Zixiang Tong**, Griffin Radtke, Mauro Rodriguez Jr., Christian Franck. Spatiotemporally-resolved kinematic and stress measurements of interfacial cavitation in soft matter. *In preparation*.
- [8] Jin Yang, Alexander McGhee, **Zixiang Tong**, Lehu Bu, Sicong Wang, Griffin Radtke, Mauro Rodriguez Jr., Christian Franck. Repetitive Laser-Induced Cavitation Dynamics and Damage at Soft Matter Interfaces. *Accepted by IMAC*, 2025.
- [7] Zhuoyi Yin, Fang Yuan, **Zixiang Tong**, Xiaoyuan He, Fujun Yang. Stereo digital image correlation using binocular super-resolution. *Measurement Science and Technology*, 2025.
- [6] Jiazheng Bao, Bin Lian, **Zixiang Tong**, Jeffrey Leu, Jin Yang, Donglei Fan. Strong and tough organogels enhanced by phase separation and in-situ polymerization. *In preparation*.

- [5] **Zixiang Tong**, Sophie Polidoro, Zhaobang Hou, Jin Yang. Exploring the Interplay of Alveolar Mechanics and Fluid Accumulation in Pulmonary Edema: Insights from Soft Metamaterials 3D Printing and Mechanical Testing. *Proceedings of the SEM Annual Conference*, 2024.
- [4] **Zixiang Tong**, Liuning Gu, and Xinxing Shao. Refraction error analysis in stereo vision for system parameters optimization. *Measurement*, 2023, 222: 113650.
- [3] Liuning Gu, Wenwu Chen, Xiaohan Hu, **Zixiang Tong**, Xinxing Shao. Refraction correction for deep-water three-dimensional visual measurement based on multi-objective optimization. *Optics Express*, 2023, 31(19): 31383-31396.
- [2] **Zixiang Tong**, Xinxing Shao, Zhenning Chen, Xiaoyuan He. Optimization of the forearm angle for arm wrestling using multi-camera stereo digital image correlation: A preliminary study. *Theoretical and Applied Mechanics Letters*, 2021, 11(6): 100287.
- [1] Qiyu Zhu, **Zixiang Tong**, Fang Yuan, Kang Wei, Xinxing Shao, Xiaoyuan He. *Journal of Medical Biomechanics*, 2021: E423-E439.

Patents

- [1] Xinxing Shao, **Zixiang Tong**, Liuning Gu, et al. A 3D point cloud measurement method for muddy water based on infrared diffraction spots and binocular vision.

ORAL PRESENTATIONS

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| [6] | 2025 SEM Annual Conference (Upcoming)
3D Stereo Adaptive Mesh Augmented Lagrangian Digital Image Correlation | 06/2025
Milwaukee, WI
United States |
| [5] | 2025 IMAC Conference (Upcoming)
Repetitive Laser-Induced Cavitation Dynamics and Damage at Soft Matter Interfaces | 02/2025
Orlando, FL
United States |
| [4] | 2024 SEM Annual Conference
Exploring the rate-dependent mechanical behavior of liquid-filled metamaterials across length scales | 06/2024
Vancouver, WA,
United States |
| [3] | 2024 Southern SEM Student Symposium
Exploring the Interplay of Alveolar Mechanics and Fluid Accumulation in Pulmonary Edema: Insights from Soft Metamaterials 3D Printing and Mechanical Testing | 05/2024
Baton Rouge, LA,
United States |
| [2] | 2024 Graduate and Industry Networking Event
SpatioTemporally Adaptive Quadtree mesh (STAQ) Digital Image Correlation for Resolving Large Deformations Around Complex Geometries and Discontinuities. | 01/2024
Austin, TX,
United States |
| [1] | 2021 Chinese Congress of Experimental Mechanics
Optimization of the Forearm Angle for Arm Wrestling Using Multi-Camera Stereo Digital Image Correlation: A Preliminary Study | 04/2021
Jiaxing, Zhejiang,
China |

TEACHING EXPERIENCES

Teaching assistant: ASE324L Aerospace Material Lab	UT-Austin, 2023 Fall
Teaching assistant: ASE324L Aerospace Material Lab	UT-Austin, 2024 Spring
Teaching assistant: ASE324L Aerospace Material Lab	UT-Austin, 2024 Fall

MENTORING EXPERIENCES

- Zane Hong Zheng, Undergraduate Research Student, UT-Austin, 2023 - present.
Current position: Third year undergraduate at UT-Austin.
 - Nathaniel Beasley, Undergraduate Research Student, UT-Austin, 2024 - present.
Current position: Fourth year undergraduate at UT-Austin.
 - Andrew Doty, Undergraduate Research Student, UT-Austin, 2024 - present.
Current position: Fourth year undergraduate at UT-Austin.
 - Junyong Kim, Undergraduate Research Student, UT-Austin, 2024 - present.
Current position: Fourth year undergraduate at UT-Austin.
 - Xinyi Chen, Undergraduate Exchange Student, UT-Austin, 2024 - present.
Current position: Fourth year undergraduate at Tsinghua University.
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MEMBERSHIPS IN PROFESSIONAL AND HONORARY SOCIETIES

- Student Member, Society for Experimental Mechanics (SEM), 2023 – present
 - Student Member, International Digital Image Correlation Society (iDICs), 2023 – present
 - Participant, Stereo Digital Image Correlation Challenge 2.0 (<https://idics.org/challenge>)
 - Project assistant, Digital Volume Correlation Challenge 2.0 (<https://idics.org/challenge>)
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Zixiang Tong, Ph.D. Student

The University of Texas at Austin
Department of Aerospace Engineering and Engineering Mechanics

Zixiang Tong earned a B.Eng. in Engineering Mechanics from Southeast University in 2020 and an M.S. in Solid Mechanics from the same institution in 2023. Since Fall 2023, he has been pursuing a Ph.D. in Mechanics at the University of Texas at Austin as a member of the Yang Group in the Department of Aerospace and Engineering Mechanics, under the guidance of Dr. Jin Yang. His research focuses on advancing digital image/volume correlation (DIC/DVC) algorithms for extreme conditions and characterizing viscoelastic materials under extreme loading scenarios.