

# Weiyun XU, Ph.D.



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## EDUCATION

- 2014-09 — 2018-06  **School of Mechanical Engineering, Shanghai Jiao Tong University**  
Bachelor of Mechanical Engineering GPA: 3.95 Rank: 1/27
- 2018-09 — 2024-06  **School of Mechanical Engineering, Shanghai Jiao Tong University**  
MS and PhD joint program of ME GPA: 3.69 Rank: 3/108

## RESEARCH PUBLICATIONS

### Journal Articles

- 1 **Xu W Y**, Wang L W, Liu Z, Zhu P. General assembly rules for metamaterials with scalable twist effects[J]. International Journal of Mechanical Sciences, 2023, 259: 108579.
- 2 **Xu W Y**, Zhang L, Zhang B Q, Zhang H Y, Liu Z, Zhu P. Crushing behavior of contact-aided AlSi10Mg sandwich structure based on chiral mechanical metamaterials[J]. International Journal of Mechanical Sciences, 2023, 260: 108636.
- 3 **Xu W Y**, Liu Z, Wang L W, Zhu P. 3D chiral metamaterial modular design with highly-tunable tension-twisting properties[J]. Materials Today Communications, 2022, 30: 103006.
- 4 **Xu W Y**, Zhou C, Zhang H Y, Liu Z, Zhu P. A flexible design framework for lattice-based chiral mechanical metamaterials considering energy absorption[J]. Thin-Walled Structures, online.
- 5 **Xu W Y**, Zhang H Y, Liu Z, Zhu P. Aperiodic design framework of chiral mechanical metamaterials considering crashworthiness[J]. Journal of Mechanical Engineering. (In Chinese) (**Accept**)
- 6 Zhang L, **Xu W Y**, Qiu R Y, Xu D K, Zhang H Y, Zhu P. Multiscale-based multiaxial fatigue model of short fiber reinforced polymer composites under high-cycle proportional loading[J]. Composites Part B-Engineering, 2024, 275:111308.

### Conference Proceedings/Oral Presentations

- 1 **Xu W Y**, Zhang H Y, Liu Z, Zhu P. On the crashworthiness of aperiodic chiral mechanical metamaterials: design and modeling method[C]//Journal of Physics: Conference Series, 2639: 012029, Chinese Materials Conference 2022-2023 07/07/2023 - 10/07/2023 Shenzhen, China.
- 2 **Xu W Y**, Wang W J, Zhu P. GNN-based inverse design of three-dimensional aperiodic metamaterials enabling programmable shapes[C]. APS March Meeting 2024, Minneapolis, Minnesota, USA, March 3-8, 2024.

### Patents

- 1 **Xu W Y**, Zhu P, Liu Z, Li Y F. Chiral mechanical metamaterial sandwich structures with size-effect-free twist and the applications: CN115691719A[P]. 2023-02-03. (Chinese Patent)
- 2 **Xu W Y**, Zhu P, Guo W Z. Foldable multi-form electric vehicle: CN109178180B[P]. 2020-05-05. (Chinese Patent)
- 3 Zhang H Y, **Xu W Y**, Liu Z, Zhu P. Implementation method for aperiodic chiral mechanical metamaterial: 202410393312.7[P]. 2024-04-02. (Chinese Patent)
- 4 Liu Z, **Xu W Y**, Zhu P. Twist angle measurement fixture for compression-torsional testing of chiral mechanical metamaterial: CN116026678A[P]. 2023-04-28. (Chinese Patent)
- 5 Zhu P, **Xu W Y**, Liu Z, Li M S. Mesoscopic structural optimization methods: CN110362912B[P]. 2022-11-08. (Chinese Patent)
- 6 Zhu P, **Xu W Y**, Liu Z, Wang L W, Zhang L. Automatic simulation system and method for strut-based metamaterial under multiple working conditions: CN114297877A[P]. 2022-04-08. (Chinese Patent)

- 7 Zhu P, Zhang L, Liu Z, **Xu W Y**, Song Z Z. Stiffness-based mixed rapid prediction method for fatigue life of SFRP: CN116305990A[P]. 2023-06-28. (Chinese Patent)

## Book and Chapter

- 1 Zhu P. Advanced design theory and methodology[M]. Beijing: China Machine Press, 2023, ISBN: 978-7-111-71470-5. (in Chinese) **(Responsible for Chapter 3 and 7)**

## MISCELLANEOUS EXPERIENCE

### Research Projects (Principal accomplisher)

- **Shanghai Natural Science Foundation (Grant No. 23ZR1431600)** 2023-04 — 2026-03  
Research on energy absorption mechanism and optimization design method of 3D chiral metamaterials
- **Shanghai Natural Science Foundation (Grant No. 21ZR1431500)** 2021-04 — 2024-03  
Research on data-driven multi-scale optimization design method of mechanical metamaterial
- **Personal Urban Mobility Access Program (PACE) of GM** 2018-06 — 2018-06  
Won 1<sup>st</sup> Place in Road Test Competition of PACE by General Motors (North America) Ltd.

### Awards and Achievements

- 2017/2019/2023 ■ **National Scholarship** (1%), Ministry of Education of the People's Republic of China
- 2016 ■ **National Inspirational Scholarship**, MoE of PRC
- 2017 ■ **Merit Student Award**, Shanghai Jiao Tong University
- 2018 ■ **Outstanding Graduate Award**, Shanghai Jiao Tong University
- 2018 ■ **Excellent Graduation Design Award**, School of Mechanical Engineering, SJTU
- 2019 ■ **2<sup>nd</sup> Place of 30<sup>th</sup> International Design Contest ROBOCON**, Held in MIT
- 2020 ■ **Inspirational Individual Award**, Shanghai Jiao Tong University
- 2020 ■ **Excellence Teaching Assistant Award**, Shanghai Jiao Tong University
- 2024 ■ **Shanghai PhD Outstanding Graduate Award**, Shanghai Jiao Tong University
- 2024 ■ **APS DMP Ovshinsky Travel Award**, APS Division of Materials Physics
- 2024 ■ **APS FGSA Graduate Research Excellence Travel Award**, APS FGSA

### Certification

- 2016 ■ Certified Volunteer in Shanghai International Marathon
- 2020 ■ Student President of Graduate Union, Shanghai Jiao Tong University

### Teaching Assistant

- 2019-2023 ■ Undergraduate Courses *Fundamentals of Manufacturing Processes*
- 2021-2022 ■ Undergraduate Courses *Open Source and Modeling*
- 2015-2016 ■ Undergraduate Courses *The Way To Success*

## SKILLS

- Languages ■ Strong reading, writing, and speaking competencies for English and Mandarin Chinese.
- Coding ■ Java, Python, C/C++, SQL (Postgres), JavaScript, MATLAB, Latex.
- CAD ■ Solidworks, Unigraphics NX, AutoCAD, Blender, ...
- CAE ■ ABAQUS, ANSYS, COMSOL Multiphysics, LS-DYNA, ...
- Hardware ■ Arduino, STM8/STM32, Raspberry Pi, ...
- Manufacturing ■ CNC, Casting, Additive Manufacturing (FDM, SLA, SLM, SLS), DIY 3D-Printer