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PhD in Mechanical Engineering
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EDUCATION BACKGROUND

- University of Manchester (UoM)** **08/2019 – 12/2024**
PhD in Mechanical Engineering
- Department of Mechanical, Aerospace and Civil Engineering, School of Engineering
 - Dissertation: Determination of dynamic flow stress equation based on discrete material data
 - Supervisor: Prof. Qingming Li (Q.M. Li) (Qingming.li@manchester.ac.uk)
- Harbin Institute of Technology (HIT)** **09/2015 – 07/2017**
M.E. in Aeronautical and Astronautical Science and Technology
- School of Astronautics
 - Dissertation: Experimental investigation on the impact resistance of polymer-aluminium layered plates
 - Supervisor: Prof. Wei Zhang (zhdawei@hit.edu.cn)
- Civil Aviation University of China (CAUC)** **09/2010 – 07/2014**
B.E. in Aircraft Manufacturing Engineering
- College of Aeronautical Engineering
 - Coursework: Mechanics of Materials, Aircraft Fault Diagnosis Technology, Engineering Materials, Aircraft Flight Mechanics, Aircraft Manufacturing Technology

WORK EXPERIENCE

- Postdoctoral Researcher, KAIST** **10/2025 – Present**
Supervisor: Prof. Seunghwa Ryu
- Prognostics and Health Management of Lithium-Ion Batteries Based on Neuromorphic Sensor and Artificial Intelligence framework
- Visiting Scholar, Dongguk University** **10/2025 – Present**
Supervisor: Prof. Heung Soo Kim
- Prognostics and Health Management of Lithium-Ion Batteries Based on Neuromorphic Sensor and Artificial Intelligence framework
- Teaching Assistant, University of Manchester** **09/2019-12/2023**
- Supported students to complete the course of Advanced Modelling & Simulation
 - Supported students to complete the course of Composites & Polymers
 - Demonstrated the operation procedure of Column Buckling Experiments
 - Instructed students completing the course of ANSYS Numerical Simulation
- Research Associate, University of Manchester** **10/2020-04/2024**
Supervisor: Prof. Q.M. Li
- Instructed undergraduate student thesis: Machine learning based dynamic constitutive models (10/2023-04/2024)
 - Instructed postgraduate (master's degree) student thesis: Signal analysis of damaged space structure by impact (08/2020-07/2021)
 - Instructed undergraduate student thesis: Structural health monitoring of space structures under impacts (10/2020-03/2021)

RESEARCH EXPERIENCE

Prognostics and Health Management of Lithium-Ion Batteries Based on Neuromorphic Sensor and Artificial Intelligence framework 10/2025-Present

- Conducting Battery PHM research and Leading a Battery PHM Group

Multiscale and Multiphysics Coupled Failure Mechanisms of High Energy Density Batteries under Dynamic Loading 11/2024-04/2025

- Participated in drafting the proposal for National Natural Science Foundation of China (NSFC) grant application, including the rationale, research content, objectives, and literature review. Published a paper in the *Journal of Energy Storage* as the corresponding author.

Damage Detection and Evaluation Model for Lithium-Ion Batteries under Dynamic Impact Based on Machine Learning 11/2023-06/2025

- Graduate Research Project (CAUC-funded): Proposed the core concept of the research methodology and contributed to the writing and revision of a manuscript published in the *Journal of Power Sources* as the corresponding author.

Machine Learning–Based Ballistic Resistance Modelling of Metallic Targets 07/2023-03/2025

- Developed core research concepts and methodology; authored and revised manuscripts; published two articles as the corresponding author in *Thin-Walled Structures*.

Multiscale Modelling of Impact Behaviour in Angle Interlock 3D Woven Composites 10/2023-11/2025

- Participated in constitutive modelling and simulation analysis; co-authored and published one article in the *International Journal of Mechanical Sciences* as a second author and another in the *Composite Structures* as a second author.

Mechanical Response & Damage Mechanisms of Sandwich Structures 07/2015-06/2017

- Contributed to experimental design, data acquisition, and finite element simulations for NSFC project at HIT; co-authored two articles published in the *International Journal of Impact Engineering*.

Application of Digital Image Correlation (DIC) in Sandbox impact Experiments 05/2015-08/2015

- Designed and executed DIC based penetration tests; analysed deformation fields and published findings at an American Institute of Physics (AIP) conference.

UPCOMING PUBLICATIONS (SCIE-indexed: 2, Q1: 2)

1. X. Huang, Q.M.Li, Tensor-Decomposition-Assisted Inverse Characterization of Flow Stress (TDIC-FS) for Very-high Strain-rate Impact, *International Journal of Impact Engineering*, Major Revision, 2026 April

PUBLICATIONS (SCIE-indexed: 16, Q1: 15)

First authored	5
Corresponding author	4
Battery research related	5
Impact related	15
Composites	2
Sandwiches materials	3
Metallic Material Constitutive modelling	3
Composites Material Constitutive modelling	2
Foam material	1

First Authored:

1. **X. Huang**, H.S. Kim, Advancing battery prognostics and health management: Challenges and future perspectives, *Journal of Mechanical Science and Technology* (2026) (JCR Q3, IF 1.7)
2. **X. Huang**, Q.M. Li, Determination of dynamic flow stress equation based on discrete experimental data: Part 2 Dynamic flow stress depending on strain, strain-rate and temperature. *International Journal of Impact Engineering*, 206 (2025) 105432 (JCR Q1, IF 5.7)
3. **X. Huang**, Q.M. Li, Determination of dynamic flow stress equation based on discrete experimental data: Part 1 Methodology and the dependence of dynamic flow stress on strain-rate. *International Journal of Impact Engineering*, 206 (2025) 105403 (JCR Q1, IF 5.7)
4. **X. Huang**, Q.M. Li, The legitimacy of decoupled dynamic flow stress equations and their representation based on discrete experimental data. *International Journal of Impact Engineering* 173 (2023) 104453. (JCR Q1, IF 5.7)
5. **X. Huang**, W. Zhang, Y. Deng, X. Jiang, Experimental investigation on the ballistic resistance of polymer-aluminium layered plates. *International Journal of Impact Engineering* 113 (2018) 212–221. (JCR Q1, IF 5.7)

As Corresponding Author (*Main contributions: Methodology, Conceptualization, Writing-original draft, review & Editing):

6. Y. Deng, H. Zheng, T. Zhang, **X. Huang***, Failure modes and failure energy threshold of lithium-ion batteries under extreme impact, *Engineering Failure Analysis* 196 (2026) 111084. (JCR Q1, IF 7.0)
7. Y. Deng, J. Li, **X. Huang***, Deep learning-based real-time damage assessment of lithium-ion batteries under dynamic impact, *Journal of Power Sources*, 662, (2026), 238737. (JCR Q1, IF 7.9)
8. Y. Deng, H. Zheng, **X. Huang***, Failure modes and failure energy threshold of lithium-ion batteries under extreme impact, *Journal of Energy Storage*, 150, 10 March 2026, 120037. (JCR Q1, IF 9.8)
9. Y. Deng, Y. Lv, X. Yang, C. Du, **X. Huang***, Determination of residual velocity model of finite thickness material based on Artificial Neural Network. *Thin-Walled Structures*, 216, Part B, 2025, 113685. (JCR Q1, IF 6.6)
10. Y. Deng, X. Yang, **X. Huang***, Determination of ballistic resistance model of finite thickness material based on Artificial Neural Network. *Thin-Walled Structures*, 203 (2024) 112161. (JCR Q1, IF 6.6)

Co-authored:

11. H. Wei, **X. Huang**, et al., Mesoscale damage modeling of 3D woven composites under quasi-static loads: Incorporating plasticity and fiber misalignment, *Composite Structures*, 382, 2026, 120111. (JCR Q1, IF 7.1)
12. H. Wei, **X. Huang**, et al., Multiscale modeling for the impact behavior of 3D angle-interlock woven composites, *International Journal of Mechanical Sciences*, 276 (2024) 109382. (JCR Q1, IF 9.4)
13. W. Huang, W. Zhang, **X. Huang**, et al., Dynamic response of aluminium corrugated sandwich subjected to underwater impulsive loading: experiment and numerical modelling. *International Journal of Impact Engineering* 109 (2017) 78–91. (JCR Q1, IF 5.7)
14. W. Huang, B. Jia, W. Zhang, **X. Huang**, et al., Dynamic failure of clamped metallic circular plates subjected to underwater impulsive loads. *International Journal of Impact Engineering* 94 (2016) 96–108. (JCR Q1, IF 5.7)
15. Y. Deng, H. Wu, Y. Zhang, **X. Huang**, et al., Experimental and numerical study on the ballistic resistance of 6061-T651 aluminium alloy thin plates struck by different nose shapes of projectiles. *International Journal of Impact Engineering* 160 (2022) 104083. (JCR Q1, IF 5.7)
16. N. Ye, W. Zhang, D. Li, W. Huang, W. Xie, **X. Huang**, X. Jiang, Dynamic response and failure of sandwich

plates with PVC foam core subjected to impulsive loading. International Journal of Impact Engineering 109 (2017) 121–130. (JCR Q1, IF 5.7)

17. W. Zhang, **X. Huang**, et al., Experimental investigation on ballistic stability of high-speed projectile in sand. AIP Conference Proceedings 1793, 060031 (2017).

COLLABORATION EXPERIENCE

- Physics-informed method for the prediction of dynamic flow stress data to very high strain-rate (School of Engineering, UOM) (11/2024-06/2025)
- Multiscale modelling of 3D angle-interlock woven composites (School of Astronautics, HIT) (10/2023-11/2025)
- Machine learning based Lithium-Ion batteries damage detection and evaluation under impact (College of Aeronautical Engineering, CAUC) (11/2023-06/2025)

PEER REVIEW EXPERIENCE

- **Reviewer**, International Journal of Impact Engineering, Elsevier
Reviewed manuscript (SOURCE-WORK-ID: 031d546b-a764-4110-a1bb-cf418c629ffc) - 2025
- **Reviewer**, Scientific reports, Springer Nature
Reviewed manuscript (Study on the effect of load on the structural response of projectile during penetration process) - 2024

RESEARCH INTERESTS

- Battery PHM
- Impact dynamics
- Structure health monitoring
- Artificial intelligence
- Neuromorphic sensor

COMPUTATIONAL SKILLS

- ABAQUS/ LS-DYNA: Explicit modelling in dynamic impact with user defined subroutines
- C, Python, MATLAB, Fortran: programming
- CATIA: Geometric modelling

AWARDS

- UK Henry Lester Trust Grant (05/2022)
- UK Henry Lester Trust Grant (05/2021)