Daijun HU

hudaijun@u.nus.edu | Daijun Hu | Daijun Hu | ORCID | +6584350751
Department of Mechanical Engineering, National University of Singapore, Singapore 117578

EDUCATION

National University of Singapore (NUS) Singapore
Ph.D., Mechanical Engineering *Aug. 2020 – Sep 30. 2024*

- **Supervisor**: Dr. Wentao YAN and Asso Prof. Vincent TAN
- **Research Interest**: Additive Manufacturing, Crystal plasticity, Solid mechanics.

Beihang University (BUAA) Beijing, China
M.Eng. Automotive Engineering *Sep. 2017 – Feb. 2020*

Beihang University (BUAA) Beijing, China
B.Eng. Automotive Engineering *Sep. 2013 – Jun. 2017*

EMPLOYMENT

Research Fellow Sep. 2024 – present
National University of Singapore (NUS) *Singapore*

Teaching Assistant of Mechanics of Machines Jan. 2021 – Dec. 2021
National University of Singapore (NUS) *Singapore*

Internship Sep. 2022 – Mar. 2024
*Agency for Science, Technology and Research (A*STAR)* *Singapore*

- Modeling for Project: Dislocation mediated material model for AM material.

PUBLICATIONS

[1] **Daijun Hu**, Nicolò Grilli, Lu Wang, Min Yang, Wentao Yan, Microscale residual stresses in additively manufactured stainless steel: computational simulation. ***Journal of the Mechanics and Physics of Solids***, 2022, 161:104822. Link

[2] **Daijun Hu**, Nicolò Grilli, Wentao Yan, Dislocation structures formation induced by thermal stress in additive manufacturing: multiscale crystal plasticity modeling of dislocation transport. ***Journal of the Mechanics and Physics of Solids***, 2023, 173: 105235. OA Link

[3] **Daijun Hu**, Zixu Guo, Nicolò Grilli, Aloyius Tay, Zhen Lu, Wentao Yan, Understanding the strain localization in additively manufactured materials: micro-tensile tests and crystal plasticity modeling, ***International Journal of Plasticity***, 2024, 103981. OA Link

[4] **Daijun Hu**, Yingchun Shan, Tian He, Xiandong Liu, Xiaofei Wan, Research on simulation method of impact resistance of composite wheels made of long glass fiber reinforced thermoplastic introducing anisotropic property, ***Composite Structures***, 2019, 223, 110965. Link

[5] **Daijun Hu**, Nicolò Grilli, Wentao Yan, From process to property: multi-physics modeling of dislocation dynamics and microscale damage in metal additive manufacturing. ***Computational Mechanics***, 2024. OA Link

[6] **Daijun Hu**, Yingchun Shan, Tian He, Xiandong Liu, Analysis on effect of injection residual stress on impact resistance of composite wheel made of long glass fiber reinforced thermoplastic. ***International Journal of Crashworthiness***, 2021, 26(5):515-525. Link

[7] Shi Dai, **Daijun Hu**, Nicolò Grilli, Shaohua Zou, Zichen Deng, Wentao Yan, Anisotropic and high-temperature deformation behavior of additively manufactured AlSi10Mg: experiments and microscale modeling, ***Additive Manufacturing***, 2024, 89: 104285 (**co-first author**). Link

[8] Nicolò Grilli, **Daijun Hu**, Dewen Yushu, Fan Chen, Wentao Yan, Crystal plasticity model of residual stress in additive manufacturing using the element elimination and reactivation method. ***Computational Mechanics***, 2022, 69(3). OA Link

[9] Zixu Guo, Ziyuan Song, Haohao Liu, **Daijun Hu**, Dawei Huang, Xiaojun Yan, Wentao Yan, A dislocation-based damage-coupled constitutive model for single crystal superalloy: unveiling the effect of secondary orientation on creep life of circular hole. ***International Journal of Plasticity***, 2024, 103874. Link

[10] Shiwei Wu, Hou Yi Chia, Tianlong Zhang, Yuefei Jia, Yongkun Mu, Qing Zhang, Yung Zhen Lek, **Daijun Hu**, Lei Fan, Wentao Yan, A precipitation-strengthened high-entropy alloy with high (Al+ Ti) content for laser powder bed fusion: Synergizing intrinsic hot-cracking resistance and ultrahigh strength. ***Acta Materialia***, 2023, 119193. Link

[11] Yang Liu, **Daijun Hu**, Mingliang Wang, Qian Wang, Bo Cui, Hong Zhu, Yanan Fu, Shenbao Jin, Bingkun Zou, Di Zhang, Yuhan Ju, Y.Morris Wang, Wentao Yan, Zan Li, Self-tuning microstructural heterogeneity for high-strength additively manufactured aluminum alloys. ***Nature Materials***, under review (**co-first author**).

[12] Yue Cui, Lei Fan, Zhiqian Zhang, Pei Wang, Wei Huang, **Daijun Hu**, N Wentao Yan, Shuai Chen, Post-Rapid-Solidification Dislocation Structures of Additively Manufactured Metals, ***Nature Communications***, under review.

[13] Lu Wang, Yefeng Yu, **Daijun Hu**, Wentao Yan, "Chapter 9: Multiscale modeling applied to additive manufacturing", ***Fundamentals of Multiscale Modeling of Structural Materials***, W. Xia, Ed., 1st Edition, Elsevier, 2022, pp. 333–388. (**Book chapter**) Link

Invited Reviewer of: *Additive Manufacturing, Material & Design, Journal of Alloys and Compounds, Vacuum, European Journal of Mechanics/A Solids, 3D Printing and Additive Manufacturing*

TALKS & CONFERENCES

[1] Crystal plasticity modeling framework for mechanical behaviors of additively manufactured materials. *Invited talk at Norwegian University of Science and Technology*, Trondheim, Norway, 2023. (Host: Assoc. Prof. Jun Ma)

[2] Crystal plasticity modeling framework for additive manufacturing. *Invited talk at Fraunhofer IAPT*, Hamburg, Germany, 2023. (Host: Dr. Philipp Kohlwes)

[3] Crystal plasticity model for microscale residual stress and dislocation dynamics in additive manufacturing. *Invited talk at Beihang University*, Beijing, China, 2022. (Host: Prof. Xiandong Liu)

[4] Crystal plasticity model for multi-material additive manufacturing. *Invited talk at Shanghai Jiaotong University*, Shanghai, China, 2024. (Host: Dr. Lin He)

[5] **Daijun Hu**, Nicolò Grilli, Wentao Yan, ***Keynote talk:*** Crystal plasticity modeling framework for microscale residual stress and dislocation dynamics in additive manufacturing. *International Conference on Simulation for Additive Manucaturing (SIM-AM)*, Munich, Germany, 2023.

[6] **Daijun Hu**, Nicolò Grilli, Wentao Yan, Crystal Plasticity Modeling of Thermal Stress, Dislocation Dynamics and Cracking in Metal Additive Manufacturing *International Conference on Computational & Experimental Engineering and Sciences (ICCES)*, Singapore, 2024.

[7] **Daijun Hu**, Nicolò Grilli, Wentao Yan, Crystal plasticity modeling framework for microscale residual stress and dislocation dynamics in additive manufacturing. *International conference on materials for advanced technologies (ICMAT)*, Singapore, 2023.

[8] **Daijun Hu**, Nicolò Grilli, Wentao Yan, Computational Modelling for Microscale Mechanical behaviours of Additively Manufactured Stainless Steel. *International Conference on Engineering Structural Integrity Assessment (ESIA17)*, Manchester, UK, 2023.

[9] **Daijun Hu**, Nicolò Grilli, Wentao Yan, Multiscale Computational Model for Microscale Residual Stress and Dislocation Dynamics in Additively Manufactured 316L Stainless Steel, *15th World Congress on Computational Mechanics (WCCM-APCOM)*, Yokohama, Japan, 2022.

[10] **Daijun Hu**, Nicolò Grilli, Wentao Yan, Crystal Plasticity Model for Microscale Residual Stress in Additive Manufacturing. *International Solid Freeform Symposium (SFF)*, Texas, US, 2021.

Language Skills: Chinese (*native*), English (*advanced*)

HONORS & AWARDS

- 1st place in sub-continuum mesoscale modeling, AM-Bench, National Institute of Standards and Technology (NIST), USA, 2022
- National Scholarship, China, 2019
- PhD Research Excellence Award, NUS, Singapore, 2023
- Outstanding Graduate of Beijing, China, 2020
- First prize scholarship, BUAA, China 2018
- Innovation Scholarship of the Ministry of Industry and Information Technology, China, 2019