XUAN ZHOU

Ph.D. Candidate

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A. EDUCATION

Politecnico di Milano	Mechincal Engineering	Double Ph.D. Candidate, 2021-Present
Beihang University	Flight Vehicle Design	Ph.D. Candidate, 2019-Present
Beihang University	Flight Vehicle Design	M.Eng. Candidate, 2017-2019
Beihang University	Aircraft Design and Engineering	B.E., 2013-2017

B. RESEARCH INTERESTS

- Structural Integrity and Airframe Digital Twin
- Structural Health Monitoring
- Surrogate Modelling in Engineering

C. PUBLICATIONS, PATENTS & ORAL PRESENTATIONS

Journal Articles and Book Chapters

1. **Zhou, X.**, Sbarufatti, C.*, Giglio, M., Dong, L.* (2023), A Fuzzy-set-based Joint Distribution Adaptation Method for Regression and its Application to Online Damage Quantification of a Structural Digital Twin. **Mechanical Systems and Signal Processing**, Accept.
2. Zhao, F., **Zhou, X.***, Wang, C., Dong, L.*, & Atluri, S. N. (2023), Setting Adaptive Inspection Intervals in Helicopter Components, Based on a Digital-Twin. **AIAA Journal**, Accept. (Corresponding Author)
3. **Zhou, X.**, Dong, L. (2022). Digital Twin driven damage diagnosis and prognosis of complex aircraft structures. **Handbook of Digital Twins**, CRC Press. (In Press)
4. **Zhou, X.**, Oboe, D., Poloni, D., Sbarufatti, C.*, & Dong, L.*, Giglio, M. (2022). A Cluster-based Joint Distribution Adaptation Method for Debonding Quantification in Composite Structures. **AIAA Journal**. https://doi.org/10.2514/1.J062417
5. He, S., Wang, C., **Zhou, X.** *, Dong, L. *, & Atluri, S. N. (2022). Weakly Singular Symmetric Galerkin Boundary Element Method for Fracture Analysis of Three-Dimensional Structures Considering Rotational Inertia and Gravitational Forces. **Computer Modeling in Engineering & Sciences**, 131(3), 1857–1882. https://doi.org/10.32604/cmes.2022.019160 (Corresponding Author)
6. **Zhou, X.**, He, S. *, Dong, L., & Atluri, S. N. (2022). Real-Time Prediction of Probabilistic Crack Growth with a Helicopter Component Digital Twin. **AIAA Journal**, 60(4), 2555–2567. https://doi.org/10.2514/1.J060890
7. Zhao, F., **Zhou, X.**, Dong, L. (2021). An Intelligent Digital-Twin-Based Strategy for the Inspection and Repair of Aircraft Skin Cracks. Chinese Journal of Solid Mechanics, 42(03), 277 – 286. https://doi.org/10.19636/j.cnki.cjsm42-1250/o3.2021.030
8. Dong, L., Zhou, **X., Zhao**, F., He, S., Lu, Z., & Feng, J. (2021). Key Technologies for Modeling and Simulation of Airframe Digital Twin. Acta Aeronautica et Astronautica Sinica, 42(03), 113-141. https://doi.org/10.7527/S1000-6893.2020.23981 (EI, in Chinese)

Patents

1. Dong, L., **Zhou**, X., Lu, Z. (2022). Online structural damage quantification method based on the domain adaptation, CN 202210493415.1. (in Chinese, Accepted)
2. Dong, L., **Zhou**, X., Zhao, F. (2020). Life management method, equipment and medium of helicopter dynamic components based on digital twin concept, CN 202010388598.1. (in Chinese, Accepted)

Conferences

1. **Zhou**, X., Dong, L.* (2020), Airframe digital twin case study of a helicopter component, Oral presentation at the 20th National Conference on Fatigue and Fracture (NCFF-20), Chongqing, China.
2. **Zhou**, X., Dong, L.* (2019), Machine Learning based Crack Growth Predictions: Application to a Helicopter Component, Oral presentation at the 6th Asia-Pacific International Conference on Computational Methods in Engineering (ICOME-19), Dalian, China.

D. PARTICIPATED PROJECTS

Optimization of the bolt layout in bolted structures

Role: Main Participants **Duration: July 2021 – Dec 2021**

- Developed a parametric characterization method for the bolt positions in bolted structures.
- Constructed surrogate models to quickly predict the bolt force.
- Proposed a surrogate-based bolt layout optimization framework.

Review of ADT Technologies for Fatigue Life Assessment

Role: Main Participants **Duration: May 2019 – Oct 2019**

- Reviewed the evolution of the airframe safety design philosophy and digital twin concept.
- Summarized five key technologies related to the modeling and simulation of airframe digital twin.
- Discussed future research directions of the five key technologies, to provide references for the systematic study and engineering applications of the airframe digital twin.

E. CURRICULUM & SKILLS

- **Curriculum:** Aircraft Structural Mechanics, Machine Learning, Mathematical Statistics, System Health Monitoring, Mechanics of Elasticity, Matrix Theory, Computing Method, Mathematical Analysis for Engineering, Theoretical Mechanics, Mechanics of Materials, Aerodynamics.
- **Foreign Language:** English (IELTS: 6.5)
- **Professional software:** ABAQUS, ANSYS, PATRAN, AutoCAD, SOLIDWORKS, CATIA.
- **Programming languages:** Python, MATLAB, C#, Modelica.

F. PRACTICAL EXPERIENCE

- Teaching assistant for Aircraft Structural Mechanics for two semesters, School of General Engineering, Beihang University. (2019-2020)
- Teaching assistant for Mechanics of Materials for one semester, School of Aeronautic Science and Engineering, Beihang University. (2018)
- Volunteer commentator at Beijing Air and Space Museum (2015-2016)
- President of Beihang Military Amateur Association (2015-2016)

G. SELECTED AWARDS AND HONORS

- Award from the Academic Excellence Foundation of BUAA for PhD Students (2022)
- Outstanding Graduate of Beihang University (2021, 2022)
- Merit Student of Beihang University (2016,2018,2022)
- Outstanding Graduate from Beihang University (2017)
- First Prize of China Aeromodelling Design Challenge (2014)