Haopeng Zhang

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EDUCATION

Apr. 2023 - present **PhD in Manufacturing Engineering of Aerospace Vehicle**, *Northwestern Polytechnical University (NPU)*, Xi'an, China.
- Supervisors: Prof. Kaifu Zhang Prof. Kuan Lu

Aug. 2020 - Apr. 2023 **Master in General and Fundamental Mechanics**, *NPU*, Xi'an, China.
- Supervisor: Prof. Kuan Lu
- Degree: Master of Engineering has been conferred on Apr. 2023
- **Weighed Average Score: 88.18/100, ranking of 1/24**
- Core Modules: Linear and Non-linear Vibration Theory (93), Control Technique of Vibration (94), Intelligent Algorithm in Engineering Application (96), Finite Element and Dynamic Substructures Methods for Vibration Analysis (94), Signal Processing and Modal Analysis (93)

Aug. 2016 - Jul. 2020 **Bachelor in Engineering Mechanics**, *NPU*, Xi'an, China.
- Degree: Bachelor of Engineering has been conferred on Jul. 2020
- **Weighed Average Score: 85.96/100, ranking of 13/54**
- Core Modules: Elasticity (94), Hydrodynamic (Bilingual, 94), Fluid-Structure Interaction (100), Mechanical Vibration (89), Computational Method (93), Vibration Control Technique (90)

Master's Thesis (Excellent Thesis Award)

Thesis Title: *Research on Vibration Mechanism of Dual-rotor System of Aero-engine with Coupling Fault*

Description: *Both a simulation model and an experimental set-up were established to explore the vibration mechanism of a fault aero-engine dual-rotor bearing system. In the simulation, the finite element method and the HB-AFT method were utilized to model and solve the ODEs governing the motion of the system. Furthermore, the fault parameter sensitivity was analyzed based on the frequency spectrum, time series, Poincaré section, and bifurcation theory.*

Bachelor's Thesis (Excellent Thesis Award)

Thesis Title: *Modeling and Vibration Suppression of Rotor-bearing System of Large Rotating Machinery*

PUBLICATIONS

2022 **H. Zhang**, K. Lu, W. Zhang, C. Fu. Investigation on dynamic behaviors of rotor system with looseness and nonlinear supporting. *Mechanical Systems and Signal Processing*. 166 (2022) 108400.

2022 K. Lu, W. Zhang, **H. Zhang**, K. Zhang, H. Cheng, C. Fu. Nonlinear Dynamic behaviors of a dual-rotor bearing system with coupling misalignment fault. *Measurement Science and Technology*. 34(1) (2022) 014005.

2021 K. Lu, Y. Jin, P. Huang, F. Zhang, **H. Zhang**, C. Fu, Y. Chen. The applications of POD method in dual rotor-bearing systems with coupling misalignment. *Mechanical Systems and Signal Processing*. 150 (2021) 107236.

2021 K. Lu, **H. Zhang**, K. Zhang, Y. Jin, S. Zhao, C. Fu, Y. Chen. The Transient POD Method Based on Minimum Error of Bifurcation Parameter. *Mathematics*. 9 (2021) 392.

2021 K. Lu, N. Wu, K. Zhang, C. Fu, Y. Jin, Y. Yang, **H. Zhang**. Dynamical Behaviors Analysis of the Rotor Model with Coupling Faults and Applications of the TPOD Method. *Applied Science*. 150 (2021) 107236.

2020 K. Lu, **H. Zhang**, H. Zhou, Y. Jin, Y. Yang, C. Fu. Application of the Second Dimension Reduction Method in Nonlinear Rotor Dynamic System. In: Lacarbonara W., Balachandran B., Ma J., Tenreiro Machado J., StepanG. (eds), *Nonlinear Dynamics of Structures, Systems and Devices*. Springer, Cham,2020, 0: 533-548.

2020 K. Lu, K. Zhang, **H. Zhang**, X. Gu, Y. Jin, S. Zhao, C. Fu, Y. Yang. A Review of Model Order Reduction Methods for Large-Scale Structure Systems. *Shock and Vibration*. 10(21) (2020) 7415.

EXPERIENCES

Short-term Study Abroad Programmes

Jul. 2018 Vrije Universiteit Brussel *Belgium, sponsored by NPU*

Nov. 2019 Chiba University *Japan, sponsered by Excellence 9*

Nov. 2019 Kanazawa University *Japan, sponsored by Excellence 9*

Summer School Course

Jun. 2022 - Jul. 2022 **Dynamic analysis of multiple degrees of freedom systems**, *Delft University of Technology*, Netherlands. By Prof. Saullo G. P. Castro.

Teaching Assistant

Apr. 2021 - Jul. 2021 **Course: Fluid-structure interaction**, *NPU*, Xi'an, China.

Duties/Responsibilities:

- Teaching Harmonic Balance Method to undergraduates.
- Marking and recording of final tests and examinations.

ACADEMIC ACTIVITIES

Conference Oral Presentation

May 2023 **The 19th National Conference on Non-Linear Vibration**, *NVND2023*, Tianjin, China.
Title: Research on the coupling fault mechanism of a two-spool rotor bearing system

May 2021 **The 18th National Conference on Non-Linear Vibration**, *NVND2021*, Guangzhou, China.
Title: Dynamic behaviors of a multi-disc rotor system with non-linear stiffness support and loosening fault

Research Project

Jan. 2020 - Dec. 2022 **Research Programme Funded by State Key Laboratory**, *Nonlinear Dynamic Characteristics of Rolling Bearing Failure in Large Rotating Machinery*, Shijiazhuang, China.

Duties/Responsibilities:

- Establishing a FEM model for a Large Rotating Machinery.
- Analysing the effect of bearing seat loosening fault on the rotor-bearing system.
- Developing a Matlab APP: Parametric Modelling, Calculating and Analysing System for Rotor Dynamics (Copyright No. 2022SR1348044)
- Establishing a rotor set-up.

Sep. 2019 - Apr. 2020 **National Student Innovation Training Programme**, *Analysis of the mechanical behavior of flexible electronic star suits in the temperature field*, Xi'an, China.

Duties/Responsibilities:

- Formulating a project development plan as a leader.
- Organising project seminars.
- Designing and assembling a property of the star suit.

HONORS & AWARDS

Jun. 2023 Excellent Thesis Award (the first 4 out of 155, master's thesis) *NPU, China*

Apr. 2023	Outstanding Master's Degree Graduates	*NPU, China*
Dec. 2022	Second Prize in Graduate Future Flight Vehicle Innovation Competition	*China*
Jul. 2020	Excellent Thesis Award (the first 10% out of 134, bachelor's thesis)	*NPU, China*
	Outstanding Bachelor's Degree Graduates	*NPU, China*
Oct. 2019	National Encouragement Scholarship	*China*
2019 - 2023	The First Prize Scholarship (5 times)	*NPU, China*
Apr. 2019	Honorable Mention in Mathematical Contest in Modeling	*USA*

LANGUAGES & SKILLS

Language

Chinese	Native
English	IELTS: 6.5 (Test report form Number: 23CN119518ZHAH001A)

Programming

Advanced	MATLAB, LaTeX
Intermediate	PYTHON, Maple

Technical

Advanced	ANSYS, SOLIDWORKS, Photoshop, Origin, Microsoft Office suite, Mathematical Modeling, Numerical Simulation, Problem-solving, Leadership, Creativity, Logical thinking