

Rui Chen - CV

Education

Scuola Superiore Sant'Anna, Pisa, Italy

PhD in Emerging Digital Technologies (Marie Curie Research Fellow under ReWIRE Program) **2023.10 - Present**

Research Focus: Soft actuators, soft exoskeleton, and haptic technology.

Tsinghua University, Beijing, China

Master of Science in Mechanical Engineering **2019.09 - 2023.08**

Research Interests: Fluid-Structure Interaction, 3D Reconstruction, Dynamics/Vibration, Tribology

RWTH Aachen University, Aachen, Germany

Master of Science in Product System Engineering (Double Master Degree Program) **2019.09 - 2023.08**

Research Interest: Data Analysis

Southwest Jiaotong University, Chengdu, China

Bachelor of Science in Mechanical Engineering **2015.09 - 2019.06**

Research Experience

Robotic Soft Exosuit for Manipulation Restoration after SCI

PERCRO lab, Scuola Superiore Sant'Anna, Pisa, Italy **2023.10 - Present**

- Developing pneumatic soft actuators for wearable robotics, including flexible exoskeletons and haptic devices.
- Designing and prototyping soft robotic systems to aid in gross manipulation recovery post-SCI.
- Conducting experimental validations on actuator performance and system integration.

Effect of Atmospheric Environment on Tribological Properties of Nickel-Based Alloys

State Key Laboratory of Tribology, Tsinghua University, Beijing, China **2023.01 - 2023.08**

- Investigated how oxide films on Inconel X750 affect the tribological properties of aluminum foil under varied loads, frequencies, and atmospheres using an SRV tribological testing machine.
- Analyzed friction coefficients, wear rates, and microcracking via SEM.

Dynamic Modeling and Experimental Validation of Hydrodynamic Bearings

State Key Laboratory of Tribology, Tsinghua University, Beijing, China **2020.10 - 2022.12**

- Developed a fluid-structure coupling model using FDM for gas film pressure distribution and FEM for foil deformation.
- Designed a test bench to experimentally validate the angular vibration behavior of the bearing system.
- Utilized Matlab and ANSYS for simulation, and CAD tools for platform design.

3D Measuring Platform Development Using Point Cloud Reconstruction Technology

State Key Laboratory of Tribology, Tsinghua University, Beijing, China **2020.10 - 2021.12**

- Designed a prototype for non-contact, high-precision 3D measurement using dual laser displacement sensors.
- Achieved 3D point cloud reconstruction with filtering, alignment, and calibration techniques.

Automated Plausibility Checks for SCADA-Data of Wind Turbines

Center for Wind Power Drives, RWTH Aachen University, Aachen, Germany **2019.10 - 2020.01**

- Developed Python algorithms to identify implausible SCADA data using machine learning and physical rules.

- Enhanced data integrity in wind turbine monitoring systems.

Publications

- **Chen, R.**, Zhao, Y., Yao, J., Wang, Z., *Research on the Performance of Foil Thrust Bearings under Dynamic Disturbances*, Tribology International, Vol. 174, 2022. (**JCR Q1**)
- Chen R, Zhang C, Cheng Y, Zixi W. *Investigation of the Vibration Behavior of a Foil Thrust Bearing Housing Under Angular Disturbance of the Runner*, International Conference on Mechanical System Dynamics. China, 2023. (**Oral Presentation, Best Paper Award**)
- Chen, R., Jiang, Y., Xi, P., *Research on Vibration of Foil Thrust Bearings*, 10th China Conference on Magnetic Levitation Technology and Vibration Control (CSMLVC10). China, 2022.
- Wang, Z., Li, Z., Chen, R., *Progress in the Study of Suspension Bearings (Magnetic Bearings and Foil Bearings)*, Advanced Engineering Technologies International Scientific Conference. Russia, 2022.
- Software Copyright: *Foil Thrust Bearing Performance Calculation Software v1.0*, China, 2022.

Skills

- **Programming:** Matlab, Python, C++
- **Modeling and Design:** SolidWorks, AutoCAD, ProE
- **Simulation:** ANSYS, FEM
- **Data Analysis:** Python, Origin
- **Experimental Techniques:** SEM, sensor-based measurement
- **Languages:** Chinese (Native), English (IELTS 6.5), German (Basic)

Awards and Honors

- **Best Paper Award, International Conference on Mechanical System Dynamics**, 2023
- **Tsinghua-Shenyang Hunnan Talent First Class Scholarship**, 2022
- **Golden Prize**, 7th China International College Students' Innovation and Entrepreneurship Competition, 2021
- **Excellent Graduate Thesis**, Southwest Jiaotong University, 2019
- **National Encouragement Scholarship**, Southwest Jiaotong University, 2018
- **Second Prize**, China Modeling and Drawing Competition, 2017

Extracurricular Activities

- Member, **Tsinghua University Mountaineering Team**, 2021 - Present
- Member, **Art Troupe of Southwest Jiaotong University**, 2017 - 2019

- Intern, **China Railway Engineering Service Company**, 2018
 - Marketing Assistant, **Training Institution**, 2016 - 2017
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