

Jiabin Pan (潘嘉滨)

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EDUCATION BACKGROUND

Wuhan Institute of Technology

Sept 2015 – Jun 2019

Bachelor of Mechanical and Electronic Engineering

Wuhan, China

Dissertation title: “Error Modeling and Analysis of Robot Milling Process”

Shanghai University

Sept 2019 – Jun 2022

Master of Mechatronic Engineering and Automation

Shanghai, China

Thesis: “Research on Compliant Parallel Mechanism for ICF Mirror”

PUBLICATIONS

- [1] Fu, Z., **Pan, J.**, Spyrakos-Papastavridis, E., Chen, X., Li, M., 2020. A Dual Quaternion-Based Approach for Coordinate Calibration of Dual Robots in Collaborative Motion. *IEEE Robotics and Automation Letters* 5, 4086–4093. doi:10.1109/lra.2020.2988407.
- [2] Fu, Z., **Pan, J.**, Spyrakos Papastavridis, E., Lin, Y.-H., Zhou, X., Chen, X., Dai, J.S., 2020. A Lie theory based dynamic parameter identification methodology for serial manipulators. *IEEE/ASME Transactions on Mechatronics* 1–12. doi:10.1109/tmech.2020.3044758.
- [3] Xiong, J., Fu, Z., Chen, H., **Pan, J.**, Gao, X., Chen, X., 2020. Simulation and trajectory generation of dual-robot collaborative welding for intersecting pipes. *The International Journal of Advanced Manufacturing Technology* 111, 2231–2241. doi:10.1007/s00170-020-06124-w.
- [4] **Pan, J.**, Fu, Z., et al, G-Code based off-line programming of robotic machining for trajectory generation. *The International Journal of Advanced Manufacturing Technology*. (Under review).

RESEARCH EXPERIENCES

Coordinate Calibration of Dual Robots

Jun 2019 – Dec 2019

Natural Science Foundation of China

- Analyzed the kinematic model of dual robots coordinate calibration, $\mathbf{AXB}=\mathbf{YCZ}$, and established its linear equations based on quaternion.

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- Wrote the MATLAB calibration program, used SVD algorithm to achieve the linear equations solving process.
 - Processed the collected experimental data (images) to generate calibration data sets, finished the calibration experiment verification, and analyzed the error and robustness of the proposed algorithm with the existing two methodologies.

Robot Off-line Programming

Aug 2019 – May 2020

Innovation Group Foundation of Hubei

- Internship at COBOT Company, developed a robotic machining system on Linux platform in collaboration with a small team, realized the robot machining simulation.
- Analyzed the conversion mechanism between robot program and G-code, integrated robot offline programming in the developed software.
- Assisted the team in applying for software copyright, and independently wrote a paper on the proposed methodology, which was being reviewed by journals, Robotics and Autonomous Systems.

Identification of Robot Dynamic Parameter

Apr 2020 – Sept 2020

Natural Science Foundation of China

- Based on Lie theory, analyzed two robot dynamic models, Newton Euler and Lagrange, and completed the MATLAB code verification combined with the software Adams simulation.
- Utilized LMI (Linear Matrix Inequality) and SDP (Semi-definite Programming) technology to solve the linear equation of the robot dynamic, achieved the dynamic parameters calibration on the real robot.
- Worked with the tutor, completed the paper writing and submission, and successfully published the paper on IEEE-ASME T MECH.

Design and analysis of flexible replaceable module

Aug 2020 – May 2021

- Designed a flexible replaceable module (FRM) for compliant parallel mechanism, and established its stiffness model and closed-form equations of compliance factors.
- Based on finite element software, ANSYS, completed the FRM modal analysis.
- Built an experimental platform to verify the stiffness model of FRM, related experiments and paper writing are being carried out.

SKILLS & INTERESTS:

- Computer Skills: Qt, Adams, Ansys Workbench, LaTeX.
- Programming: MATLAB, C/C++, Python.
- Technology, Interests: Robot trajectory planning, Robotic interaction control, Machine learning and deep learning.