

EDUCATION

- **Beihang University** Beijing, China
Master of Mechanical Engineering; GPA: 91.79/100 *September 2021 - Present*
Courses: Nonlinear Dynamics and Control For Mechatronic Systems, Advanced Control System Design, Electro-Hydraulic Servo Control, Reliability Technology of Fault Tolerant Control System, Matrix Theory
- **Qingdao University** Qingdao, China
Bachelor of Mechanical Engineering; GPA: 90.63/100 *September 2017 - June 2021*
Courses: Advanced Mathematics, Mechanical Engineering Control Foundation, Theoretic Mechanics, The Foundation of Intelligent Instrument Design, Measurement Science in Mechanical Engineering

SKILLS SUMMARY

- **Frameworks** Autonomous Systems, Electro-hydraulic Servo Control, Adaptive Robust Control (ARC), Model Predictive Control (MPC)
- **Tools** MATLAB (Simulink), Python, C/C++, AMESim, Solidworks, AutoCAD
- **Languages** English (Fluent), Chinese (Native)
- **Soft Skills** Leadership, Event Management, Writing, Public Speaking, Time Management

PUBLICATIONS

- **Journal:**
 - [1] Liu, X., Qiu, Z., Zhang, H., Qi, P., Wang, Z., Shang, Y., & Jiao Z. (2023) Design of an aircraft autonomous traction taxiing system based on hydraulic secondary regulation. Chinese Journal of Aeronautics. (Minor Revision)
 - [2] Qiu, Z., Liu, X., et al. Adaptive robust motion control of hydraulic load sensitive systems considering displacement dynamic compensation. (Manuscript in preparation)
 - [3] Liu, X., Wang, Z., Qiu, Z., Qi, P., Wu, S., Shang Y., & Jiao Z. (2023). Hydraulic pump weight estimation method based on similarity principle. Chinese Hydraulics & Pneumatics (Chinese). 47(2), 117-124.
- **Conference:**
 - [4] Qiu, Z., Liu, X., Wang, Z., Shang, Y., & Jiao, Z. (2023, August). Output feedback decoupling control of active load-sensitive hydraulic systems with extended state observer. In 2023 international conference on fluid power and mechatronics (FPM). IEEE.
 - [5] Wang, Z., Liu, X., Qiu, Z., & Shang Y. (2023, August). Research on cascade control method for hydraulic secondary regulating transmission system. In 2023 international conference on fluid power and mechatronics (FPM). IEEE.
- **Patent:**
 - [6] Qiu, Z. 2022. A control method of hatch hydraulic system based on weight moment compensation. CN Patent Application CN116163619A, filed December 2022. Patent Pending
 - [7] Qiu, Z. 2022. Active load sensing hydraulic actuation system. CN Patent Application CN116181179A, filed December 2022. Patent Pending
 - [8] Qiu, Z. (co-inventor) 2022. Adaptive robust control method and device with inertia compensation. CN Patent Application CN114690640A, filed March 2022. Patent Pending
 - [9] Qiu, Z. (co-inventor) 2022. Identification of the external frame weight moment and friction moment of a horizontal three-axis hydraulic flight motion simulator. CN Patent Application CN114690664A, filed March 2022. Patent Pending

RESEARCH EXPERIENCE

- **Research on Autonomous Electro-hydraulic Servo Control Technology for Load-sensitive Actuators** [2], [4], [5], [7]
Master's thesis (October 2022 - Present), Beijing, China
 - **Simulation:** Analyzed the hydraulic load-sensitive systems' dynamic characteristics and energy characteristics.
 - **Design:** Improved energy utilization efficiency of the system through enhancing the design of hydraulic components and implementing advanced control strategies.
 - **Control:** Designed a passive load-sensing system displacement dynamic compensation controller to eliminate the effects of load-induced disturbances & an active load-sensing system output feedback decoupling controller to optimize the energy-saving performance of the system.
- **Autonomous and Efficient Control Technology for Aircraft Ground Integrated Control System** [1]
Bachelor's thesis (January 2020 - September 2020), Beijing, China
 - **Strategy:** Proposed a decomposed control strategy for aircraft ground integrated control
 - **Simulation:** Implemented an efficient and safe turning maneuver through different actuator combinations at different taxiing speeds.
 - **Record:** Documented the control strategy's design, implementation details, and simulation results.
 - **Corresponding Publications:** [1]

PROJECTS

- **Simulation and Testing Project for Brake System of Aircraft**
Research project (June 2022 - October 2022), Beijing, China
 - **Design:** Designed and developed an advanced testbed for aircraft brake systems.
 - **Control:** Developed Measurement and control systems.
- **Research on Variable Displacement Hydraulic Motors and Variable Mechanism Technology**
Research project (January 2021 - December 2021), Beijing, China [3], [6]
 - **Simulation:** Established system-level variable motor mathematical model using Simulink and AMESim.
 - **Verification:** Verified the accuracy and effectiveness of the mathematical model by performing co-simulation in the Simulink-AMESim environment.
- **Research on Simulation Technology for Fixed Displacement Hydraulic Motors**
Research project (January 2021 - December 2021), Beijing, China [8], [9]
 - **Model:** Derived the dynamic model of a fixed-displacement hydraulic motor.
 - **Analysis:** Analyzed the mechanism of pressure and flow pulsations in the system based on the mathematical model.

HONORS AND AWARDS

- Student of the Year - November 2022
- Academic First Class Scholarship - September 2021
- Provincial Outstanding Student (top 1%) - August 2020
- President's Scholarship (top 1%) - November 2019