

## Education

### 2016 – 2019 Nanjing University of Aeronautics and Astronautics (NUAA), China

Master of Philosophy, research degree, Recommended Admission.

- ✧ College of Energy and Power Engineering, Department of Control Engineering.
- ✧ Thesis: Sliding Mode Fault Tolerant Control for Aircraft Engine Fuel System.

### 2011 – 2015 Nanjing University of Aeronautics and Astronautics (NUAA), China

Bachelor of Engineering, Recommended Admission.

- ✧ College of Energy and Power Engineering.
- ✧ Thesis: Guaranteed Cost Control for a Class of Engine System, an LMI Way.

### 2008 – 2011 Jinan Foreign Language School (JNFLS), China

Languages: Chinese (Native), English

IELTS: 7.5/9.0 (Listening: 7.5/9.0, Reading: 9.0/9.0, Writing: 6.5/9.0, Speaking: 6.0/9.0)

## Research Interests

- ✧ Advanced Control Theory (Robust Control, Sliding Mode Control, Optimal Control).
- ✧ Turbine Propulsion System, Quadrotor Control.
- ✧ Machine Learning.

## Academic Experiences

### 1. Indoor Navigation and Force Control of Two Aerial Robot System.

on-going

- ✧ A Parrot Mambo with PD controller, feedback from EKF based on optical flow and IMU.
- ✧ A Parrot Bebop2 running Ardupilot, feedback from motion capture system.
- ✧ Robots hover and generate specific force with certain direction.

### 2. Control Algorithm Design and Applications for Electric Aircraft Fuel System

09/2017-09/2018

- ✧ Electric aircraft fuel modeling.
- ✧ Control law based on sliding mode control, robust to mismatched uncertainties.
- ✧ Simulation test in MATLAB/Simulink
- ✧ An experimental platform based on Raspberry Pi and STM32, with a UI coded in Python.

### 3. Fault Tolerant Control for Aircraft Fuel System

01/2016-06/2018

- ✧ A sliding mode observer to estimate the actuator faults in real time.
- ✧ A corresponding fault tolerant control law to compensate it.

### 4. Research on Aircraft Control System Sensor Fault Diagnosis and Fault Tolerant Control

06/2013-06/2014

- ✧ Built a fault diagnosis system based on BP neural network and Support Vector Machine.
- ✧ Active fault tolerant control strategy is proposed based on Augmented LQR method.

### 5. Strategy Optimization in Traffic Light Control

03/2013-06/2013

- ✧ Optimized timing strategy of traffic lights to minimize waiting time.
- ✧ Conducted a simulation test coded in C++ to simulate traffic flow on a main road in Nanjing, China.
- ✧ Won the Third Prize in the 7th National University Students Social Practice and Science Contest on Energy Saving & Emission Reduction.

## Technical Competencies

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- ✧ Calculus, Linear Algebra, Probability, Matrix.
- ✧ Automatic Control, Theory of Linear System, Optimal Control, Digital Control System, Adaptive Control.
- ✧ ROS, C, C++, Python, and MATLAB/Simulink.

## Publications

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\*Corresponding author, [J xx] for Journal, [C xx] for Conference, [P xx] for Patent.

[J 07] **DING Runze**, \*Xiao Lingfei. 'Robust Control for Electric Fuel Pump with Variant Nonlinear Loads Based on a New Combined Sliding Mode Surface'. *International Journal of Control, Automation and Systems*. (2019) 17: 716.

[J 06] **DING Runze**, \*Xiao Lingfei. 'Quadratic Integral Sliding Mode Control for Nonlinear Harmonic Gear Drive Systems with Mismatched Uncertainties.' *Mathematical Problems in Engineering*. (2018):1-18.

[J 05] Zhou li, Ye zhifeng, \*Xiao Lingfei, **DING Runze**, 'Gain Scheduling Control for Aero-engine Based on Guardian Maps Theory', *MACHINERY & ELECTRONICS*. 2018, 36(5):18-23.

[J 04] Du Yanbin, \*Xiao Lingfei, Chen Yuhan, **DING Runze**. 'Aircraft Engine Gas Path Fault Diagnosis Based on Hybrid PSO-TWSVM.' *Transactions of Nanjing University of Aeronautics and Astronautics* 2(2018).

[J 03] \*Xiao, Lingfei and **DING Runze**. 'Uncertainty and Disturbance Estimator based Control of Active Suspensions with a Hydraulic Actuator.' *Information Technology & Control* 45.4(2017).

[J 02] **DING Runze**, \*Xiao Lingfei, and Jiang Bin. 'Robust Fault Tolerant Control for Aircraft Longitudinal Attitude Sensor Faults.' *Journal of Shanghai Institute of Technology* (2015).

[J 01] Huang Yakun, **DING Runze**, \*Zhao zhiwen, 'Timing optimization and simulation of traffic lights in main road.' *Shandong Industrial Technology*, 2014(9):55-57.

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[C 03] **DING Runze**, \*Xiao Lingfei. 'Research of Sliding Mode Control in Electric Fuel Pump System'. *Proceedings of 19th Conference on Aeronautical Automatic Control*(2018).

[C 02] **DING Runze**, \*Xiao Lingfei. 'Quadratic integral Sliding Mode Control in Turboshift Engines'. *Proceedings of 18th Conference on Aeronautical Automatic Control, Chinese Society of Aeronautics and Astronautics* (2016).

[C 01] **DING Runze**, \*Xiao Lingfei, Hu Jixiang. 'Guranteed Cost Fault Tolerant Control for STOVL Aircraft Engines.' *Proceedings of CPCC 2016* (2016).

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[P 02] Xiao Lingfei, **DING Runze**, et.al, 'Robust Fault Tolerant Method for Sensor Fault in Electrical Fuel Pump system', P. CN 2017110310135.

[P 01] Xiao Lingfei, **DING Runze**. 'Harmonic gear transmission quadratic integral sliding mode controller design',

## **Awards**

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- ✧ 2019 Best Student Papers, NUAA
- ✧ 2019 Outstanding Graduate Awards, NUAA
- ✧ 2018 National Scholarship, China
- ✧ 2017 GUOSHENG Student Scholarship, China
- ✧ 2016 - 2018 Scholarship for MPhil, NUAA
- ✧ 2016 Outstanding Freshmen Scholarship, NUAA
- ✧ 2016 Excellent Volunteer, Plan to the West, China
- ✧ 2015 Outstanding Graduate Awards, NUAA
- ✧ 2014 Third Prize in the 7th National University Students Social Practice and Science Contest on Energy Saving & Emission Reduction, China.
- ✧ 2011-2015 Second/Third Prize Scholarship, NUAA

## **Voluntary Experiences**

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2015-2016 China Youth Volunteers Program, Plan of University Students Volunteers to the West

- ✧ Serving as voluntary teacher in Tibet for one year.
- ✧ Formed and headed aircraft model team in primary school, motivating students' interests.
- ✧ Contacting with organizations or enterprises, gather more than 15000 dollars donation to local poor area.

## **Academic Group & Funds**

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- ✧ Investigator of 2016 Innovation Open Fund for Postgraduate, NUAA
- ✧ IEEE Student Member