

Jiachen Li

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EDUCATION BACKGROUND

Harbin Institute of Technology <ul style="list-style-type: none">Automation, <i>undergraduate junior</i>GPA: 3.72/4 , 86.54/100Institute of Intelligent Control and Systems, supervised by Jianbin Qiu and Tong Wang	2019.9 - 2023.7
Nanyang Technological University Summer School <ul style="list-style-type: none">Robotics, Automation and IoT ProgrammeDistinction, supervised by Ming Xie	2021.7 - 2021.8
Harbin Institute of Technology International Summer School <ul style="list-style-type: none">Artificial IntelligenceLecture-based, supervised by Jianwei Ma	2021.8 - 2021.9

REASERCH INTERESTS

Fuzzy control, event-triggered control, nonlinear control, fault-tolerant control, partial differential equations, game theory, decision-making and planning, robotics, reinforcement learning, computer vision

PUBLICATIONS

- Runsheng Guo, **Jiachen Li**, Kangkang Sun, Tong Wang, and Jianbin Qiu. Output-Feedback Boundary Adaptive Fault-Tolerant Control for Scalar Hyperbolic PDE Systems with Actuator Faults. International Journal of Adaptive Control and Signal Processing. Under review.
- Hao Zhang, **Jiachen Li**, Tong Wang, Jianbin Qiu. A Mixed Control Approach to Nonlinear Coupled Burgers' PDE-ODE Systems with Sensor Nonlinearities. 2022 the 41st Chinese Control Conference. Accepted.
- Zichen Yao, Zhanwen Yang, Yongqiang Fu, **Jiachen Li**. Asymptotical stability for fractional-order Hopfield neural networks with multiple time delays. Mathematical Methods in the Applied Sciences.

RESEARCH EXPERIENCES

Tracking control of nonlinear discrete systems based on zero-sum games <ul style="list-style-type: none">Designed a distributed feedforward tracking controller which can transform distributed tracking control problem in strict-feedback form into an equivalent distributed differential game problem of tracking error dynamics in affine formProposed a distributed zero-sum differential game strategy bu using adaptive dynamic programming technique and creating a critic network to	2021.9 - present
Autonomous vehicles decision-making algorithm research <ul style="list-style-type: none">Applied reinforcement learning to make specific behavioral decisions combined with the perception moduleDesigned Fuzzy Petri nets to validate and propose more specific metrics for our algorithm	2022.1 - present
Intelligent Micromanipulation Robots <ul style="list-style-type: none">Used zebrafish as a model to test the realization of different functions of the systemProcessed the image of zebrafish based on OpenCV	2021.7 - 2021.9
Output-Feedback Boundary Adaptive Fault-Tolerant Control for Scalar Hyperbolic PDE Systems with Actuator Faults <ul style="list-style-type: none">Developed parameter updating laws of gradient type to compensate actuator faults along with parameter uncertainties, based on which the adaptive FTC problem for scalar hyperbolic PDE system was effectively addressed	2021.4 - 2021.9
Control of Nonlinear Coupled Burgers' PDE-ODE Systems with Sensor Nonlinearities <ul style="list-style-type: none">Proposed a mixed control approach to produce a fuzzy-model-based controller tackling the time dimensional nonlinearity and a boundary controller eliminating the space dimensional nonlinearityApplied the proposed mixed control approach to a nonlinear hypersonic rocket car to testify its validity	2021.4 - 2021.9

Asymptotical stability for fractional-order Hopfield neural networks

2020.9 - 2021.4

- Gave a boundary of the stability region for linear fractional-order differential equations with delay, which is an open problem for six years
- Established framework for stability analysis of fractional-order Hopfield neural networks with multiple time delays and obtained a necessary and sufficient condition in a coefficient-type criterion, which is delay-independent

COMPETITION EXPERIENCES

National College Competition on Internet of Things

2022.1 - 2022.4

Disorderly gripping of robotic arms

- Used 3D point clouds to identify object types and locations
- Designed a robotic arm to gripping control by hand-eye calibration

National Undergraduate Electronics Design Contest

2021.10 - 2021.11

Appliance analysis and identification device

- Designed a device that determined the type and operating status of an electrical appliance
- Used converter, filter circuits and LSTM for signal processing

National University Student Engineering Training Comprehensive Ability Competition

2020.12 - 2021.4

Intelligent Delivery Robot

- Designed a robot that can identify objects and automatically deliver

COURSE PROJECTS

Automatic Control Practice II

2022.4 - 2022.5

- Used matlab and simulink to identify the parameter of servo system in Webots virtual environment
- Adopted the double closed-loop PID controller and the disturbance observer to control the pitch axis and yaw axis of aircraft

Automatic Control Practice I

2021.11 - 2021.12

- Designed a specific motor control circuit with adjustable-speed drives, user-friendly operations, and a low cost, and then completed the soldering
- Analyzed the relationship between input/output quantities by regulating the input signal and measuring the corresponding output

SKILLS AND QUALIFICATIONS

- **Proficient** : Python, PyTorch, Matlab, Simulink, Latex, HTML
- **Familiar** : C/C++, TensorFlow, Keras, Verilog, etc.
- **Duolingo**: 110
- **GRE**: 334/340+5/6.0 (Verbal 165, Quantitative 169, Analytical Writing 5)

OTHERS / SUMMARY

- Passionate about technology, love programming, solid foundation, good programming habits
- Lively and polite personality, strong communication and collaboration as well as social skills, organizational leadership
- Love writing, travel, good at organizing and summarizing