

Jiaming Qi

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📄 <https://scholar.google.com.hk/citations?user=x4RZReMAAAAJ&hl=zh-CN>

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Education

- 2018 – Present **Ph.D., Control Science and Engineering, Harbin Institute of Technology.**
Research direction: *Deformable Objects Manipulation*
Main content: Robot Manipulation, Computer Vision, Deep Learning, Adaptive Control, Visual Servoing, Mobile Manipulator Platform Development
Supervisor: Prof. Guangfu Ma
- 2019 – 2020 **Visiting PhD Student, Robotics and Machine Intelligence Laboratory, The Hong Kong Polytechnic University.**
Research direction: *Vision-based Shape Control of Deformable Objects.*
Supervisor: Dr David Navarro-Alarcon
- 2016 – 2018 **M.E., Integrated Circuit Engineering, Harbin Institute of Technology.**
GPA: 3.68/4, Rank: 2/111
Thesis: *Li-ion Battery Online Impedance Detection System Design.*
- 2012 – 2016 **B.E., Agricultural Electrification and Automation, Northeast Agricultural University.**
GPA: 3.87/4, Rank: 3/152
Thesis: *ADuCM360-based Pressure Transmitter HART Communication System Design.*

Research

Interest

- Human-robot Collaborative Interaction Deformable Objects Manipulation
- Shape Perception, Estimation and Reconstruction of Deformable Objects
- Learning-based Deformable Objects Manipulation
- Model-free Adaptive Control for the Deformable Objects Manipulation
- Model-free Visual-servoing of 6-DOF Robot Manipulator

Preprints

1. **J. Qi**, W. Ma, G. Ma, H. Gao, and D. Navarro-Alarcon*, "Adaptive Shape Servoing of Elastic Rods using Parameterized Regression Features and Auto-Tuning Motion Controls", Awaiting Final Decision.
2. **J. Qi**, D. Li, Y. Gao, P. Zhou, G. Ma, D. Navarro-Alarcon*, "MPC-Based 3D Manipulation of Compliant Objects with Process-Supervised Motion Model and Adversarial Network for Occlusion Removal", Submitted.

Journal Articles

1. **J. Qi**, G. Ma, J. Zhu, P. Zhou, Y. Lyu, H. Zhang, D. Navarro-Alarcon*, "Contour Moments Based Manipulation of Composite Rigid-Deformable Objects With Finite Time Model Estimation and Shape/Position Control", IEEE/ASME Transactions on Mechatronics, 2021. (IF = 5.303)
2. **J. Qi**, G. Ma, P. Zhou, H. Zhang, Y. Lyu, D. Navarro-Alarcon*, "Towards latent space based manipulation of elastic rods using autoencoder models and robust centerline extractions", Advanced Robotics, 36 (3), 101-115, 2022. (IF = 1.699)

3. S. Zou, Y. Lyu, **J. Qi**, G. Ma, Y. Guo, "A deep neural network approach for accurate 3D shape estimation of soft manipulator with vision correction", *Sensors and Actuators A: Physical*, 2022. (IF=4.291)
4. D. Navarro-Alarcon*, **J. Qi**, J. Zhu, A. Cherubini, "A Lyapunov-stable adaptive method to approximate sensorimotor models for sensor-based control", *Frontiers in Neurorobotics*, 2020. (IF = 2.650)

Conference Proceedings

1. G. Ma, **J. Qi**, Y. Lyu, H. Zeng, "Active Manipulation of Elastic Rods using Optimization-based Shape Perception and Sensorimotor Model Approximation", *Chinese Control Conference (CCC 2022)*, (Supervisor, First Author) (Accepted, unpublished), 2022.
2. H. Z. Z. Lu, Y. Lyu, **J. Qi**, "Adaptive Neural Network-based Visual Servoing with Integral Sliding Mode Control for Manipulator", *Chinese Control Conference (CCC 2022)*, (Accepted, unpublished) 2022.
3. W. Ma, **J. Qi**, D. Navarro-Alarcon, "Automatic Shape Control of Deformable Rods Based on Data-Driven Implicit Sensorimotor Models", *International Conference on Intelligent Robots and Systems (IROS)*, 2020.
4. **J. Qi**, Y. Lv, D. Gao, Z. Zhang, C. Li, "Trajectory Tracking Strategy of Quadrotor with Output Delay", *International Conference on Instrumentation & Measurement, Computer, Communication and Control (IMCCC)*, 2018.

Projects

1. **Deformable Objects Manipulation** 09.2019 - Present
 - Physical modeling of deformable objects (kinematics, dynamics)
 - Shape perception, estimation, and reconstruction of the deformable objects
 - Cybernetics-based solutions for the deformable objects manipulation
 - Learning-based solutions for the deformable objects manipulation
2. **Multi-sensor Fusion Hardware-in-the-loop Simulation System** 07.2018-08.2019
 - Establish multi-sensor (earth sensor, sun sensor, gyroscope) model and actuator dynamic model, and perform simulation verification in Matlab/Simulink
 - Realize the four-layer STM32F4-PCB with C language
 - Realize a C# host platform for data exchanging, processing, and command control
 - Realize a physical joint verification (Matlab, C#, STM32F4), and write the reliability analysis
3. **Lithium Battery Impedance Test Platform Implementation and Design** 05.2017-05.2018
 - Build the lithium battery impedance model, and the quantitative relationship among impedance, temp, humidity, SOC, etc.
 - Realize a hardware system including AD5940, and a single-chip microcomputer (ADuCM360/361) with C language
 - Realize a human-computer C# host platform with SPI, I2C and UART communication
 - Realize amplitude/phase calibration, data reception, processing, real-time display, and stability analyse, e.g., Bode, Nyquist.
4. **Quadrotor Aerial Vehicle Tracking Algorithm Design** 11.2016-05.2017
 - Realize the attitude solution (Quaternion, Euler angle), Kalman state estimation, and trajectory tracking
 - Realize a four-layer STM32F4-PCB onboard 10-axis IMU, which can output high-precision Euler angle
 - Realize UART, SPI, I2C communication, position and incremental PID control, FATFS external FLASH to save data

- Realize a C# host control platform, and real-time display and process the data from GPS, UWB, US-100

5. Field Unattended Station Monitoring System Design

01.2017-05.2017

- Realize the linkage function of 8-way stepper motor, 18-way limit switch, 6-way relay and 1-way hydraulic lifting elevator
- Realize the RS485 communication host computer control interface, control box operation mode switching, hangar operation status monitoring
- Realize UART, SPI, I2C communication, and FATFS external FLASH for data saving and processing under emergency braking
- Realize a C# host control platform, and real-time display the operation state of the field station

6. Water Quality Monitoring System Based on Modbus485

09.2016-05.2017

- Realize Modbus field bus communication protocol
- Realize four-layer water-quality monitoring STM32F4-PCB, and build a mathematical model of water pollution
- Realize GPS accurate field positioning and emergency diagnostics

Work experience

1. Application Engineer, Analog Devices, Inc., Beijing, China

05.2017-05.2018

- Li-ion Battery Online Impedance Detection System Design (Graduation Project)
- ADuCM360/361 microcontroller integration with AD5941 portable application design
- Li-ion battery impedance model establishment and online identification algorithm design
- Li-ion battery C# evaluation platform (real-time data processing)
- Li-ion battery operation state monitoring and balanced power analyses through CAN/UART/SPI communication protocol

2. Application Engineer, Analog Devices, Inc., Beijing, China

03.2016-09.2016

- ADuCM360-based Pressure Transmitter HART Communication System Design (Graduation Project)
- ADuCM360/361 duplex-ADC Labview evaluation system design and user manual writing
- ADuCM360/361 Multiwire-RTD temperature measurement model establishment and Labview evaluation systems design
- ADuCM360/361 14-bit PWM DAC circuit design and joint-KEYSIGHT 3458A-1/2 Labview visualization platform
- ADuCM360/361 HoneyWell 24PCXXH6D high-precision pressure sensors system modeling, application and validation

Competitions and awards

- The First Prize Scholarship*2 (master, 2017, 2018)
- Outstanding Graduates Award in Heilongjiang Province (bachelor, 2016)
- Comprehensive Quality First-class Scholarship*3 (bachelor, 2013, 2014, 2015)
- Three-Good Student*3 (bachelor, 2013, 2014, 2015)
- The Second Prize in Mathematical Modeling in Heilongjiang Province (bachelor, 2014)
- Engineering Fund (Ph.D Candidate, 2018)

Academic service

- Robotics and Automation Letters
- IEEE International Conference on Robotics and Automation
- IEEE International Conference on Advanced Robotics and Mechatronics

Skills

Languages	📖	Strong reading, writing and speaking competencies for English, Mandarin Chinese.
Coding	📖	C/C++, C#, Python, Matlab, ROS, OpenCV, Open3D, PCL
Hardware	📖	STM32, ADuCM360/361, 51-Microcontroller
Software	📖	Visual Studio, Pycharm, Keil, IAR, Cadence Allegro, Altium Designer, Multisim, Labview
Toolkits	📖	Pytorch, TensorFlow, Sklearn, Mujoco, etc.
Misc.	📖	Academic research, teaching, training, consultation, Latex typesetting and publishing.

I certify that all the above information is complete and true; all information is supported by necessary documents and certificates