

# Jiaming Qi

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🌐 <https://jiamingqi-tom.github.io/>

📄 <https://scholar.google.com.hk/citations?user=x4RZReMAAAJ&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

### Journal Articles

1. **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)
2. **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).
3. 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.

## Under Review

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", IEEE TCST, 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", IEEE TASE, Submitted.
3. P. Zhou, **J. Qi**, Z. Wu, D. Navarro-Alarcon\*, "Chase it: Reactive Deformable Linear Objects Shape Servoing with Graph Neural Networks and Fixed-time Sliding Mode Control", IEEE TMECH, Submitted.

## 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

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

## Skills

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

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