Chengzhe **Jia**

11168 Tyrolean way, Country of San Diego, CA 92126

(+1) 858-539-3966 | jia.chengzhe98@gmail.com | https://jaking98.github.io/

Education Background

University of California San Diego (UCSD)

California, USA

M.S. in Mechanical and Aerospace Engineering

Sept. 2021 - Jul. 2023

- **GPA:** 3.84/4.00
- **Selected Relevant Courses:** Topics in Engineering Science-Design of Haptic Systems (A), Robotics (A+), Linear Control Design (A+), Robot Motion Planning (A), Topics in Engineering Science-Electric Power System Modeling (A-), Advance Technics in Computational Math I (A)

Beijing University of Technology (BJUT)

Beijing, China

B.S. in Measurement and Control Technique and Equipment

Sept. 2016 - Jul. 2020

- **GPA:** 3.49/4.00
- **Award:** The Third Scholarship of BJUT (top 30%)
- **Selected Relevant Courses:** Computer Language Training (90/100), Fundamentals of Circuit Analysis(91/100), Fundamentals of Mechanical Accuracy Design (Bilingual)(80/100), Course Design of Precision Machine Design (86/100), Electrical and Electronic Technology Courses(97/100), Circuits for Measurement and Control (87/100), Course Design of Sensing and Testing Technology (87/100)

Publications

Controlling the Motion of Gas-Lubricated Adhesive Disks using Multiple Vibration Sources

Frontiers in Robotics and AI

First Author

Under final round review

- **Jia, C.**, Ramanarayanan, S., Sanchez, A., Tolley, M.,2023. Controlling the Motion of Gas-Lubricated Adhesive Disks using Multiple Vibration Sources. Frontiers in Robotics and AI(FRAI).

Vehicle Attribute Recognition Algorithm Based on Multi-task Learning

2019 IEEE SmartIoT

Second Author

Agu. 2019

- Sun, J., **Jia, C.** and Shi, Z., 2019, August. Vehicle attribute recognition algorithm based on multi-task learning. In 2019 IEEE International Conference on Smart Internet of Things (SmartIoT) (pp. 135-141). IEEE.

Percussion Characteristic Analysis for Hydraulic Rock Drill with no Constant-Pressurized Chamber through Numerical Simulation and Experiment

Advances in Mechanical Engineering

Third Author

Apr. 2019

- Ma, W., Geng, X., **Jia, C.**, Gao, L., Liu, Y. and Tian, X., 2019. Percussion characteristic analysis for hydraulic rock drill with no constant-pressurized chamber through numerical simulation and experiment. Advances in Mechanical Engineering, 11(4), p.1687814019841486.

Professional Experience

Sim2Real Manipulation on Unknown Objects with Tactile-based Reinforcement Learning

Xiaolong Wang's Lab, UCSD

Full-Time Research Assistant

Mar. 2023 - Present

- ⋆ *The aim of this project is to utilize Reinforcement Learning techniques to train a robot arm equipped with tactile sensors. By learning specific operations on a range of objects within a virtual environment and testing the trained policy in the real world, the ultimate goal is to achieve the capability to complete specific tasks even when faced with unknown objects. In this project, my primary responsibility lies in the 'to real' component. This involves replicating the virtual world environment in the real world, conducting experimental tests on the existing policy, and iteratively refining it. Simultaneously, I learned the complete process of Reinforcement Learning projects, including building pipelines, constructing virtual testing environments, and drafting reward functions. I was also responsible for the final writing and editing of the article.*⋆
- Supervisor: Prof. Xiaolong Wang.
- Plan to submit the paper to ICRA 2023 (International Conference on Robotics and Automation).

Controlling the Motion of Gas-Lubricated Adhesive Disks using Multiple Vibration Sources

Bioinspired Robotics and Design Lab, UCSD

Sole Project Leader

Feb. 2022 - Jun. 2023

- ⋆ *As the sole operator of the project, I independently designed and constructed a disk-shaped robot. Utilizing multiple vibration motors as the driving source, I achieved controlled motion of the robotic disk on inverted and upright surfaces. The underlying principles behind this project's motion dynamics have scarcely been analyzed. Consequently, this robot stood as the pioneering model that exclusively employs multiple vibration sources as its driving force. It also represented the first scientific exploration of such a design dynamic.*⋆
- Supervisor: Prof. Michael T. Tolley.
- **The article has been submitted** to the FRAI journal (Frontiers in Robotics and AI). It is currently under final round review.

Measuring Instrument Operation

Institute of Metrology, National Institute of Metrology, China

Lab Intern *Jun. 2019 - Jul. 2019*

- ⋆ *During this internship period, I primarily focused on learning the operational procedures of various precision measuring instruments and was responsible for conducting inspections on a variety of sent-in equipment. The main function of the institution was to establish standards for different units of measurement and utilize high-precision measuring equipment to verify other metrological instruments. The inspection reports issued by this institution served as robust endorse for the credibility of specific surveying and mapping equipment.*⋆
- Supervisor: Dr. Yao Huang.

Vehicle Attribute Recognition Algorithm Based on Multi-task Learning

School of Computer and Communication Engineering, USTB

Research Assistant *Mar. 2019 - Jun. 2019*

- ⋆ *The objective of this project was to develop a highly accurate image processing algorithm using convolutional neural networks. The aim was to achieve the identification of vehicle brands and colors within images or videos, enhancing the recognition capabilities in this context. In this project, I primarily focused on learning computer vision concepts and techniques. My responsibilities included constructing and augmenting the model database used for training neural networks.*⋆
- Supervisor: Prof. Zhiguo Shi.

Percussion Characteristic Analysis for Hydraulic Rock Drill with no Constant-Pressurized Chamber through Numerical Simulation and Experiment

School of Mechanical Engineering, USTB

Research Assistant (the only undergraduate in Group of Seven) *Aug. 2018 - Feb. 2019*

- ⋆ *The aim of this project was to establish a robust model for a Hydraulic Rock Drill, with the goal of optimizing its performance. The project's challenges predominantly stemmed from two aspects: the overall construction of the model and fine-tuning of crucial parameters to achieve alignment with real-world behavior. In this project, my primary responsibility involved real-world data collection. By selecting appropriate sensors, setting up and optimizing the testing platform to minimize environmental noise interference, and effectively gathering relevant data. Further analysis of the collected data allowed for improvements to the existing computational model.*⋆
- Supervisor: Prof. Fei Ma.

Multifunctional Robot Design for Family Safety

National University Student Innovation Program, BJUT

Core Member in Group of Five *Dec. 2017 - Jul. 2018*

- ⋆ *The goal of this project was to create a home-based robotic vehicle equipped with features like automatic obstacle avoidance, monitoring of environmental temperature and humidity, smoke detection with alarms, and a multimedia information board. I was responsible for developing all functionalities except for the automatic obstacle avoidance, as well as designing and constructing the overall structure of the robot.*⋆
- Supervisor: Senior Engineer Shuwen Sun.
- Awarded **the Second Prize** of the 12th iCAN International Contest of Innovation (BJUT Division).

Automatic Food Pickup Robot Design

Spark Fund Project, BJUT

team Leader in Group of Five *Dec. 2016 - Aug. 2017*

- ⋆ *As the first project I engaged in upon entering university, our objective was to construct an automated cart capable of picking up fast food items and transporting them to the counter. Due to a lack of background knowledge at the time, the cart's grasping function could not be successfully realized. However, during this project, as the team leader, I became acquainted with the entire process of a project, from inception to final implementation and operation. This experience sparked my interest in the field of robotics, motivating me to embark on a path of scientific research exploration.*⋆
- Supervisor: Senior Engineer Shuwen Sun.
- Awarded **the Certification** of 18th Spark Fund Project.

Selected Course Projects

Advanced Planning Algorithms for Robots Motion

MAE 242

Solo independent project *SPRING 2022*

- ⋆ *In this course, we accomplished a motion trajectory planning task for robots. Within a 2D plane, we utilized Reinforcement Learning techniques to design motion trajectories for multiple robot agents. This involved helping them avoid 'dangerous' areas, obtaining goal 'rewards,' and ultimately reaching their designed destinations.*⋆
- Course Title: Robot Motion Planning.
- Course Instructor: Prof. Sonia Martinez.

Custom Haptic Device 'Hapkit' Building

MAE 207

Solo independent project *WINTER 2022*

- ⋆ *In this course, we took a hands-on approach to build a 1-DOF haptic device. The device was driven by a single motor and controlled through programming with Arduino. By altering the motor's operation, we achieved various tactile outputs, thereby enabling different tactile sensations. Building upon this foundation, we created a virtual environment using 'Processing' and combined it with the tactile output from a joystick. This allowed users to have a more intuitive sensory experience.*⋆
- Course Title: Design and Control of Haptic Systems.
- Course Instructor: Prof. Tania Morimoto.
- Video demos could be found at: `https://jaking98.github.io/portfolio/MAE-207_Hapkit/`

“Steering Wheel”— A Haptic Joystick Controller with Force Feedback

MAE 207

CORE MEMBERS OF A 2-PERSON TEAM *WINTER 2022*

- ⋆ *This project served as the final project for the course, where we designed a 2-DOF joystick controller capable of actively avoiding collisions. The device was controlled by four motors, enabling it to change direction just before a collision occurred. We constructed a virtual testing environment using ’Processing’ and invited users to participate in testing, aiming to enhance the device’s tactile performance.*⋆
- Course Title: Design and Control of Haptic Systems.
- Course Instructor: Prof. Tania Morimoto.
- Video demo could be found at: `https://jaking98.github.io/portfolio/MAE-207_Steeringwheel/`

Controlling the Motion of a UR3 Robot-arm

MAE 204

CORE MEMBERS OF A 2-PERSON TEAM *WINTER 2022*

- ⋆ *The final project of this course involved controlling a small vehicle carrying a robot arm in a virtual environment. The objective was to achieve the grasping and placing of objects at target positions. The software programming aspect was built entirely from scratch. It involved designing the motion trajectory for the gripper end-effector, establishing an inverse kinematic function to control the robot arm’s joint angles, and ultimately designing a feed-forward control system to achieve the coordinated motion of both the vehicle and the arm.*⋆
- Course Title: Introduction to Robotics.
- Course Instructor: Prof. Michael Tolley.
- Video demos could be found at: `https://jaking98.github.io/portfolio/MAE-204/`

Skills

Mathematical & Computational Software:

• MATLAB • Julia • LabVIEW • SPSS • Excel

Drawing & Modeling Software:

• CAD • Fusion 360 • SolidWorkes

Computer Language:

• Python • C# • Android Studio

Other Software & System:

• Arduino • Processing • Keil • Blender • Tracker • Latex • Markdown
• Ubuntu • Linux

Hands-on Skill:

• Structural design • Prototype design and production • Circuit analysis and design • Silicone molding

Languages:

• Mandarin Chinese (native) • English (bilateral proficiency)

Interpersonal:

• Teamwork • Communication • Mentor-ship • Leadership • Event planning • Project management