Mingxuan Li (李明暄)

Department of Mechanical Engineering, Tsinghua University
Personal homepage: https://mingxuan-li.com/
Preferred Email: mingxuan-li@foxmail.com
Phone number: +86-15211534315

EDUCATION BACKGROUND

Master: Tsinghua University, Beijing, China 09/2023–Present

- Laboratory: AutoRobot Lab, Department of Mechanical Engineering
- GPA: Overall: **3.90**/4.00
- Advisors: Prof. Yao Jiang

Visiting: Massachusetts Institute of Technology, Cambridge, U.S. 01/2025–04/2025

- Laboratory: Computer Science and Artificial Intelligence Lab (CSAIL)
- Supervisor: Prof. Edward H. Adelson

Bachelor: Tsinghua University, Beijing, China 09/2019–07/2023

- Major: Mechanical Engineering
- GPA: Overall: **3.72**/4.00

PUBLICATIONS & PATENTS

- Research Interests: ***Robotics Tactile Perception & Grasping***, ***Vision-Based Tactile Sensors***, ***Contact Modelling***
- Skills: C/C++, Python, OpenCV, PyTorch, MATLAB, AutoCAD, SolidWorks, Abaqus, Ansys, Unity, PS, PR, *et al*.

Research Paper & Preprint

- **Mingxuan. Li** and Yuxiang. Ma, "Evaluation of viscoelastic contact effects on grasping", submitted to *IEEE Transactions on Automation Science and Engineering (TASE)*. Jun. 2025.
- **Mingxuan. Li**, Lunwei. Zhang, Qiyin. Huang, Tiemin. Li, and Yao. Jiang, "Modeling, simulation, and application of spatio-temporal characteristics detection in incipient slip", in revision to *IEEE Transactions on Robotics (TRO)*. Feb. 2025. [arXiv] [Preprint_PDF]
- **Mingxuan. Li**, Lunwei. Zhang, Tiemin. Li, and Yao. Jiang, "Learning gentle grasping from human-free force control demonstration", ***IEEE Robotics and Automation Letters (RA-L)***, vol. 10, no. 3, pp. 2391-2398, Mar. 2025. [Publication] [Preprint_PDF] [Video]
- **Mingxuan. Li**, Yen. Hang. Zhou, Lunwei. Zhang, Tiemin. Li, and Yao. Jiang, "OneTip: A soft tactile interface for 6-D fingertip pose acquisition in human-computer interaction", ***Sensors and Actuators: A. Physical (SNA)***, vol. 379, Sep. 2024, Art no. 115896. [Publication] [Preprint_PDF] [Video]
- **Mingxuan. Li**, Lunwei. Zhang, Yen. Hang. Zhou, Tiemin. Li, and Yao. Jiang, "EasyCalib: Simple and low-cost in-situ calibration for force reconstruction with vision-based tactile sensors", ***IEEE Robotics and Automation Letters (RA-L)***, vol. 9, no. 9, pp. 7803-7810, Sep. 2024. [Publication] [Preprint_PDF] [EasyCalib]
- **Mingxuan. Li**, Yen. Hang. Zhou, Tiemin. Li, and Yao. Jiang, "Incipient slip-based rotation measurement via visuotactile sensing during in-hand object pivoting", ***2024 IEEE International Conference on Robotics and Automation (ICRA)***, pp. 17132-17138, Aug. 2024. [Publication] [Preprint_PDF] [Video] [Poster] [Slides]
- **Mingxuan. Li**, Yen. Hang. Zhou, Tiemin. Li, and Yao. Jiang, "Real-time and robust feature detection of continuous marker pattern for dense 3-d deformation measurement", ***Measurement***, vol. 221, Nov. 2023, Art no. 113479. [Publication] [Preprint_PDF]
- **Mingxuan. Li**, Yen. Hang. Zhou, Tiemin. Li, and Yao. Jiang, "Improving the representation and extraction of contact information in vision-based tactile sensors using continuous marker pattern", ***IEEE Robotics and Automation Letters (RA-L)***, vol. 8, no. 2, pp. 1109-1116, Sep. 2023. [Publication] [Preprint_PDF]
- **Mingxuan. Li**, Tiemin. Li, and Yao. Jiang, "Marker displacement method used in vision-based tactile sensors—from 2D to 3D: A review", ***IEEE Sensors Journal (Sensors J.)***, vol. 23, no. 8, pp. 8042-8059, Apr. 2023. [Publication] [Preprint_PDF]
- **Mingxuan. Li**, Lunwei. Zhang, Tiemin. Li, and Yao. Jiang, "Continuous marker patterns for representing contact information in vision-based tactile sensor: principle, algorithm, and verification", ***IEEE Transactions on Instrumentation and Measurement (TIM)***, vol. 71, Aug. 2022, Art no. 5018212. [Publication] [Preprint_PDF]

Patent Application

- Yao. Jiang, **Mingxuan. Li**, Lunwei. Zhang, and Tiemin. Li, "Tactile sensor, robot, method and apparatus for achieving tactile information acquisition", Application No. 202210061023.8, Publish No. CN 114544052B, 2023-03-28.
- **Mingxuan. Li**, Aijun. Yang, Yanping. Xu, Xue. Qi, and Dongqin. Li, "Method, apparatus, and electronic device for detecting image sticking in display screen", Application No. 202211286586.3, Publish No. CN 115509040A, 2022-12-23.
- **Mingxuan. Li**, Yanping. Xu, Xue. Qi, Dongqin. Li, and Fan. Wang, "Method and apparatus for touch screen detection", Application No. 202111074563.1, Publish No. CN 113984337A, 2022-01-28.

SELECTED AWARDS AND HONORS

Academic Awards

- Awarded the Wang Dazhong Scholarship (**One of the highest awards for students at Tsinghua University**) in 2024 Tsinghua Scholarship Awards Ceremony 12/2024
- **Shortlisted for Tsinghua Top Grade Scholarship (Prestigious Scholarship, 清华大学特等奖学金) in 2024 (five master students per year from all departments and grades)** 11/2024
- Exceptionally awarded the **Comprehensive Excellent First-Class Scholarship** as a first-year graduate 11/2023
- **Excellent Graduates** of Tsinghua University, 2023 06/2023
- Named the **Person of the Year** in the Department of Mechanical Engineering, Tsinghua University 04/2023
- **Neng Ke Scholarship**, Tsinghua University (**Highest amount** in M.E. department, **Top 2%** of 300) 11/2022
- **Comprehensive Outstanding Award Scholarship**, Tsinghua University (**Top 5%** of 126) 11/2021
- **1st Prize** in National Zhou Peiyuan Mechanics Competition, 2021 (**Top 0.2%**) 08/2021
- **1st Prize** in National Undergraduate Physics Competition, 2020 (**Top 1%**) 12/2020

Research Performances

- **Excellent Oral Presentation**, The 777th Doctoral Academic Forum of Tsinghua University 04/2025
- **Excellent Oral Presentation**, The 734th Doctoral Academic Forum of Tsinghua University 04/2024
- **Excellent academic paper**, The 16th National Conference on Undergraduate Innovation 12/2023
- **Outstanding Graduation Thesis** of Tsinghua University, 2023 06/2023
- **1st Place** in "New Engineering" Undergraduate Graduation Thesis Competition 06/2023
- **Project leader** of iStar Program from the Fundamental Industry Training Center, Tsinghua University (**Excellent rating**) 05/2023
- **Best Poster Award** and **Excellent Oral Presentation Award** at Tsinghua Youth Science and Innovation Forum 03/2023
- **Grand Prize of Outstanding Project** of 2022 Tsinghua University Student Research Training (SRT) Program for Undergraduates (**Top 5 of 1938**, and was **the only single person study** among them) 12/2022
- **Project leader** of National Training Program of Innovation and Entrepreneurship for Undergraduates (**Excellent rating**) 06/2022
- **Project leader** of A-level Tsinghua University Initiative Scientific Research Program (**Excellent rating**) 05/2022
- Served as the co-first author, led the team to win the **only Grand Prize in Tsinghua Craftsmanship Awards, 2022** (Received the award from **the President of Tsinghua University as the only representative**, and was **widely reported by mainstream medias in China**, including the report of **Xinhua News** with over **1.3 million views**) 04/2022
- Selected to **"Spark" Innovative Talent Cultivation Program** (**Top 2%** for outstanding research performance) 03/2022

Innovation & Entrepreneurship

Student head of the ***'ClearTactile'*** tech startup team

- **Team of Excellence**, 2024 China-U.S. Young Maker Centers Annual Conference 05/2024
- **Grand Prize** in the 2023 "Challenge Cup" Capital Science and Technology College of Extra-curricular Academic Competition 06/2023
- **4th Place** in the "Kunshan Cup" 24th Tsinghua University Entrepreneurship Competition 03/2023
- **Bronze Award** in the 8th China College Students' "Internet+" Innovation and Entrepreneurship Competition, National Finals 12/2022
- **3rd Place** in the 4th "Beijing-Tianjin-Hebei and Guangdong-Hong Kong-Macao" Youth Innovation Competition 09/2022
- **1st Prize** in the 8th China College Students' "Internet+" Innovation and Entrepreneurship Competition, Beijing Area 07/2022

- **The Top Ten Teams** in the China College Students' "Internet+" Innovation and Entrepreneurship Competition, Tsinghua University, 2022 (The only undergraduate student team) 06/2022

COMMUNITY SERVICE AND LEADERSHIP

- Reviewer: *ICRA 2024, ICRA 2025 (twice), IEEE Transactions on Instrumentation and Measurement (twice), Measurement, Visual Computer, Scientific Reports (twice), Recent Patents on Mechanical Engineering*
- Serves as **Vice President and Academic Affairs Representative of the Graduate Association**, Department of Mechanical Engineering, Tsinghua University.
- Served as **Chairman of the Sub-forum** "Robotics and Intelligent Manufacturing" and the **Organizational Committee Member**, The 777th Doctoral Academic Forum of Tsinghua University.
- Served as **Chairman of the Sub-forum** "Key Components and Equipment" and the **Organizational Committee Member**, The 734th Doctoral Academic Forum of Tsinghua University.
- **Former Vice President** of Hunan Cultural Student Association of Tsinghua, in charge of science & innovation and lecture activities.
- **Invited to give a keynote speech** at the 2022 Tsinghua Maker's Day New Age Creativity Education Forum.

OTHER RESEARCH&STUDY EXPERIENCE

China-Italy Laboratory on Advanced Manufacturing (CILAM) Summer School 2025 07/2025–08/2025

University of Bergamo and Federico II University of Naples

- Participate in lectures on topics such as Sustainability and Circularity, Additive Manufacturing, Robotics, Smart Energy & Electrification, and New Business Models.
- Visit innovation hubs including San Giovanni Academy, CeSMA Laboratory, and the Kilometro Rosso Innovation District

Research on designing and building new robot tactile sensors 01/2025–04/2025

Visiting Research, MIT CSAIL, supervised by Prof. Edward H. Adelson

- Design, build, and test novel robot tactile sensors for robotic manipulation.
- Evaluate the effects of viscoelasticity on robotic grasping based on contact modeling.

Research on the Artificial Intelligence Industry and Market 07/2024–09/2024

Interned in Equity Investment Department, Tsinghua Tongfang Technology Co., Ltd.

- Research and analyze the development, industrial layout, and investment opportunities of the artificial intelligence industry.
- Write a detailed research report for internal reference within the company.

Research on Representation and Extraction of Robotic Tactile information 04/2021–07/2023

Student Research Training Program, supervised by Prof. Yao Jiang, Tsinghua University

- Served as the sole participant (student), focused on improving the representation and extraction of tactile representation.
- Developed tactile sensor prototypes and verified the high-precision, high-resolution, and high-reliability.

Self-Initiated Research Interest Group for Undergraduates, supervised by Prof. Yao Jiang, Tsinghua University

- Served as the **student leader** of "Tactile Information Representation and Extraction" undergraduate research group.
- Developed a tactile sensor with the advantages of high information density, 3D information, compactness, etc., and initially realized the adaptive application of robot grasping and control

Research on Innovation and Application of Intelligent Software Testing 01/2021–02/2021, 07/2022–08/2022

Interned in LCFC Luzhou Laboratory, LCFC (Hefei) Electronics Technology Co., Ltd.

- Studied the detection device of LCD touch screen based and the detection method of image sticking in LCD screen.
- The first case in the company's patent application that was granted both invention patent and utility model patent.

Studying on Under-Actuated Robotic Hands and Soft Robots 09/2020–04/2021

Independent Research, supervised by Prof. Wenzen Zhang, Tsinghua University

- Studied the basic theory of robotic grasping and manipulation based on the underactuated mechanism and soft brake
- Proposed a soft robot hand based on self-curling underactuated structure and developed the prototypes.