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## Research Interests

My research interests lie at the intersection of **robotics, autonomous systems and control theory**. I focus on applying these in unstructured environments, including biomedical, healthcare, manufacturing, industrial, and aerospace settings.

- **Computational Modeling:** includes multibody mechanics, kinematics, dynamics, physics-informed simulation and optimization.
- **Advanced Control:** model-based/data-driven/stochastic/predictive control, inverse problems, motion planning, manipulation.
- **Integrated Embedded and Real-Time AI Systems:** computer vision, accelerated computing, mechatronics, sensor fusion, safety-critical design, human-in-the-loop, adaptive learning and neural networks, cyber-physical systems.

## Appointments

**University of California San Diego (UCSD)**  
Postdoctoral Scholar

San Diego, US  
Dec. 2019 – present

- Advanced Robotics and Controls Lab
- **Supervisor:** Prof. Michael Yip

**Biorobotics Institute, Scuola Superiore Sant'Anna (SSSA)**  
Senior Research Associate/Postdoc

Pisa, Italy  
Apr. 2019 – Nov. 2019

- Assistive Robotics Laboratory
- **Supervisor:** Prof. Filippo Cavallo

**Bioinspired Soft Robotics, Italian Institute of Technology (IIT)**  
Research Associate/Postdoc

Pisa, Italy  
Mar. 2018 – Mar. 2019

**ROBO Medical Technology Co., Ltd**  
Senior Control Engineer & Project Director

Shenzhen, China  
Oct. 2016 – Feb. 2018

## Education

**Institut National des Sciences Appliquées de Lyon (INSA de Lyon)**  
Ph.D. in Robotics

Lyon, France  
Sep. 2013 – Sep. 2016

*Top Engineering school in France (Grande école)*

*Top 51-75 worldwide in Mechanical Engineering based on ARWU Ranking*

- **Thesis:** Dual-user Haptic Training System
- **Supervisors:** Prof. Arnaud Lelevé, Prof. Tanneguy Redarce, Dr. Damien Eberard

**Institut National des Sciences Appliquées de Lyon (INSA de Lyon)**  
Master of Science in Control System and Automation Engineering

Lyon, France  
Sep. 2012 – Aug. 2013

- **Thesis:** Teleoperation System Using Port-Hamiltonian Approach
- **Supervisor:** Prof. Arnaud Lelevé

**Northwestern Polytechnical University (NWPU)**  
Bachelor of Science in Control System and Automation Engineering

Xi'An, China  
Sep. 2008 – Jul. 2012





Top 6th worldwide in Mechanical Engineering in ARWU Ranking  
Top 51-75 worldwide in Automation and Control based on ARWU Ranking

- **Speciality:** Automation and Inertial Navigation




## Publications

I've authored **25** papers, including **14** as the first author, in top-tier venues and conferences for robotics and control systems (RA-L, T-BME, Robotica, ICRA, IROS, EMBC etc). These papers have earned **220+** citations, with an h-index of 9.

## Journal & Book Articles (\* shares the first author)

- [RA-L'23] **Robotic Manipulation of Deformable Rope-like Objects Using Differentiable Compliant Position-based Dynamics**  [DOI]  
[Fei Liu\\*](#), Entong Su\*, Jingpei Lu, Mingen Li, Michael Yip  
*IEEE Robotics and Automation Letters (RA-L)*, 2023.
- [T-BME'23] **ORRN: An ODE-based Recursive Registration Network for Deformable Respiratory Motion Estimation with Lung 4DCT Images**  [DOI]  
Xiao Liang, Shan Lin, [Fei Liu](#), Dimitri Schreiber, Michael Yip  
*IEEE Transactions on Biomedical Engineering (T-BME)*, 2023.
- [RA-L'21] **Autonomous Robotic Suction to Clear the Surgical Field for Hemostasis Using Image-Based Blood Flow Detection**  [DOI]  
Florian Richter, Shihao Shen, [Fei Liu](#), Jingbin Huang, Emily K. Funk, Ryan K. Orosco, Michael Yip  
*IEEE Robotics and Automation Letters (RA-L)*, 2023.  
**Best Paper Award Nomination at ICRA 2021**
- [App.Sci.'20] **Review of Advanced Medical Telerobots**  [DOI]  
[Fei Liu\\*](#), Sarmad Mehrdad\*, Minh Tu Pham, Arnaud Lelevé, S. Farokh Atashzar  
*Applied Sciences*, 2020.  
**Invited Article**
- [Robotica'19] **An Energy-Based Approach for n-dof Passive Dual-user Haptic Training Systems**  [DOI]  
[Fei Liu](#), Angel Ricardo Licon, Arnaud Lelevé, Damien Eberard, Minh Tu Pham, Tanneguy Redarce  
*Robotica*, 2019.
- [Hap.Int.'19] **Applications of Haptics in Medicine**  [DOI]  
Angel R. Licon, [Fei Liu](#), David Pinzon, Ali Torabi, Pierre Boulanger, Arnaud Lelevé  
*Haptic Interfaces for Accessibility, Health, and Enhanced Quality of Life*, 2019.

## Conference Proceedings & Workshops

- [ICRA'23] **Image-based Pose Estimation and Shape Reconstruction for Robot Manipulators and Soft, Continuum Robots via Differentiable Rendering**  [DOI]  
[Fei Liu\\*](#), Jingpei Lu\*, Michael Yip  
*IEEE International Conference on Robotics and Automation (ICRA)*, 2023.
- [ICRA'23] **Suture Thread Spline Reconstruction from Endoscopic Images for Robotic Surgery with Reliability-driven Keypoint Detection Rendering**  [DOI]  
Neelay Joglekar, [Fei Liu](#), Ryan Orosco, Michael Yip  
*IEEE International Conference on Robotics and Automation (ICRA)*, 2023.
- [IROS IPPC'23] **Shape Reconstruction of Soft, Continuum Robots using Differentiable Rendering with Geometrical Shape Primitive**  [LINK]  
[Fei Liu](#), Michael Yip


*IROS Workshop on Integrated Perception, Planning, and Control for Physically and Contextually-Aware Robot Autonomy, 2023.*


- [IROS IPPC'23] **Bridging Real-to-Sim Gaps through Online Material Property Optimization with Perception-Enabled Residual Mapping**  [LINK]  
[Fei Liu\\*](#), Xiao Liang\*, Yutong Zhang, Yuele Li, Michael Yip  
*IROS Workshop on Integrated Perception, Planning, and Control for Physically and Contextually-Aware Robot Autonomy, 2023.*
- [ICRA'21] **Real-to-Sim Registration of Deformable Soft-Tissue with Position-Based Dynamics for Surgical Robot Autonomy**  [DOI]  
[Fei Liu\\*](#), Zihan Li\*, Yuhai Han, Jingpei Lu, Florian Richter, Michael Yip  
*IEEE International Conference on Robotics and Automation (ICRA), 2021.*
- [ICRA'21] **Model-Predictive Control of Blood Suction for Surgical Hemostasis using Differentiable Fluid Simulations**  [DOI]  
[Fei Liu\\*](#), Jingbin Huang\*, Florian Richter, Michael Yip  
*IEEE International Conference on Robotics and Automation (ICRA), 2021.*
- [ACIRS'21] **Simulated Data Generation Through Algorithmic Force Coefficient Estimation for AI-Based Robotic Projectile Launch Modeling**  [DOI]  
Sajiv Shah, Ayaan Haque, [Fei Liu](#)  
*IEEE 6th Asia-Pacific Conference on Intelligent Robot Systems (ACIRS), 2021.*
- [IROS'20] **Dynamically Constrained Motion Planning Networks for Non-Holonomic Robots**  [DOI]  
Jacob J. Johnson, Linjun Li, [Fei Liu](#), Ahmed H. Qureshi, Michael Yip  
*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.*
- [IROS CRS'20] **A 2D Surgical Simulation Framework for Tool-Tissue Interaction**  [ARXIV]  
Yunhai Han, [Fei Liu](#), Michael Yip  
*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Workshop on Cognitive Robotic Surgery, 2020.*
- [ICMCE'18] **Collaborative Hands-on Training on Haptic Simulators**  [DOI]  
Angel Ricardo Licona Rodriguez, [Fei Liu](#), Arnaud Lelevé, Damien Eberard, Minh Tu Pham  
*7th International Conference on Mechatronics and Control Engineering, Nov. 2018.*
- [IROS'16] **An Energy Based Approach for Passive Dual-user Haptic Training Systems**  [DOI]  
[Fei Liu](#), Arnaud Lelevé, Damien Eberard, Tanneguy Redarce  
*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct. 2016.*
- [EBMC'15] **A Dual-user Teleoperation System with Online Authority Adjustment for Haptic Training**  [DOI]  
[Fei Liu](#), Arnaud Lelevé, Damien Eberard, Tanneguy Redarce  
*37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Aug. 2015.*
- [MESROB'15] **A Dual-user Teleoperation System with Adaptive Authority Adjustment for Haptic Training**  [DOI]  
[Fei Liu](#), Arnaud Lelevé, Damien Eberard, Tanneguy Redarce  
*4th International Workshop on Medical and Service Robots, Jul. 2015.*


## Preprints & Submitted


- [TRO'24] **Parameter Identification and Motion Control for Articulated Rigid Body Robots Using Differential Position-based Dynamics**  [ARXIV]


[Fei Liu](#), Mingen Li, Jingpei Lu, Entong Su, Michael C. Yip  
*IEEE Transactions on Robotics (T-RO)*.  
In Revision (check for PDF preview)

[ICRA'24] **Achieving Autonomous Cloth Manipulation with Optimal Control via Differentiable Physics-Aware Regularization and Safety Constraints**  [ARXIV]  
[Fei Liu\\*](#), Yutong Zhang\*, Xiao Liang, Michael Yip  
*IEEE International Conference on Robotics and Automation (ICRA), 2024*.  
Under Submission

[ICRA'24] **Real-to-Sim Deformable Object Manipulation: Optimizing Physics Models with Residual Mappings for Robotic Surgery**  [ARXIV]  
[Fei Liu\\*](#), Xiao Liang\*, Yutong Zhang, Yuele Li, Shan Lin, Michael Yip  
*IEEE International Conference on Robotics and Automation (ICRA), 2024*.  
Under Submission

[ICRA'24] **SuPerPM: A Large Deformation-Robust Surgical Perception Framework Based on Deep Point Matching Learned from Physical Constrained Simulation Data**  [ARXIV]  
Shan Lin, Albert Miao, Ali Alabiad, [Fei Liu](#), Kaiyuan Wang, Jingpei Lu, Florian Richter, Michael Yip  
*IEEE International Conference on Robotics and Automation (ICRA), 2024*.  
Under Submission

[ICRA'24] **Robust Surgical Tool Tracking with Pixel-based Probabilities for Projected Geometric Primitives**  [PDF]  
Christopher D'Ambrosia, Florian Richter, Zih-Yun Chiu, Nikhil Shinde, [Fei Liu](#), Henrik Christensen, Michael C. Yip  
*IEEE International Conference on Robotics and Automation (ICRA), 2024*.  
Under Submission

[T-MECH] **An Underwater Remote Teleoperation Robot Arm with Rolling Diaphragm Actuation and End Effector Force Reconstruction**  [PDF]  
Zhaowei Yu, Dimitri A. Schreiber, [Fei Liu](#), Alexander M. Grant, Michael Yip  
*IEEE/ASME Transactions on Mechatronics (T-MECH)*.  
Under Patent Application (check for PDF preview)

### In-Preparation (coming soon with results)

[RAL] **Continuum Robot Shape Reconstruction and Tracking from Monocular Endoscopic Image Sequences**  
[Fei Liu](#), Florian Richter, Michael Yip  
*IEEE Robotics and Automation Letters (RAL)*. *to submit*




[T-RO] **SuPer-Robust: A Robust Long-term Deformation Tracking and Reconstruction Framework for Endoscopic Videos**  
Kaiyuan Wang, Shan Lin, Jingpei Lu, [Fei Liu](#), Florian Richter, and Michael Yip  
*IEEE Transactions on Robotics (TRO)*. *to submit*

[RAL] **Deformation Tracking-based Online Jacobian Estimation for Deformable Object Manipulation**  
Shan Lin, Jingpei Lu, [Fei Liu](#), Florian Richter, and Michael Yip  
*IEEE Robotics and Automation Letters (RAL)*. *to submit*

### Dissertations and Technical Papers

- [PHD'16] **Dual-user Haptic Training System**  [LINK]  
[Fei Liu](#), PhD Dissertation, INSA de Lyon, 2016.
- [Master'13] **Teleoperation System Using Port-Hamiltonian Approach**  
[Fei Liu](#), MSc Thesis, INSA de Lyon, 2013.
- [IARC'12] **Northwestern Polytechnical University Team Entry for the AUVSI International Aerial Robotics Competition**  [LINK]  
[Fei Liu](#), Yinan Sang, Jie He, Jie Fan, Ruichao Li, Xiongyi Cui, Haoyu Li, Jie Chen  
*International Aerial Robotics Competition (IARC) Symposium, Aug. 2012.*  
**Innovative Design Award**
- [MCM'11] **Modeling of the Snowboard Course**  [PDF]  
[Fei Liu](#), Haoyu Li, Li Li  
*International Mathematical Contest in Modeling (MCM) Symposium, Apr. 2011*  
**Meritorious Winner Award**

## Patents

- [PCT/US22/22820] **Real-to-Simulation Matching of Deformable Soft Tissue and Other Objects with Position-based Dynamics for Robot Control**  [PATENT]  
[Fei Liu](#), Michael C. Yip, Florian Richter, 2022.
- [CN215651505U] **Flexible Mechanical Arm and Surgical Equipment**  [PATENT]  
 Jialin Yang, Qinghao Hu, Jianxiao Chen, [Fei Liu](#), Fei Long, 2021.
- [CN216603056U] **Main Hand Control Unit and Auxiliary Robot for Digestive Tract Operation**  [PATENT]  
 Jialin Yang, Qinghao Hu, Jianxiao Chen, [Fei Liu](#), Fei Long, Luchen Shen, Liyang Lin, 2021.
- [CN215273291U] **Main Operator and Force Feedback Device**  [PATENT]  
 Jialin Yang, Qinghao Hu, Jianxiao Chen, [Fei Liu](#), Fei Long, Luchen Shen, Liyang Lin, 2021.
- [CN114129228A] **Operation Executor**  [PATENT]  
 Jialin Yang, Qinghao Hu, Jianxiao Chen, [Fei Liu](#), Fei Long, Luchen Shen, Liyang Lin, 2021.
- [CN209713128U] **A Kind of Flexible Joint Mechanism**  [PATENT]  
 Junjie Gao, [Fei Liu](#), Shunzheng Meng, Sihao Zuo, Jialin Yang, 2018.
- [CN209574762U] **Lifting Operation Instrument**  [PATENT]  
 Jialin Yang, Xilong Hou, Lijuan Yao, [Fei Liu](#), 2018.

## Research Experiences

- Advanced Robotics and Controls Lab, UCSD** **Dec. 2019 – present**
- Postdoc Scholar, ARCLab San Diego, USA
- Developing of a unified framework for modeling, simulation, and control of deformable, rigid, articulated, and fluid objects using position-based dynamics (PBD). Focus areas include robotic manipulation (impedance control, trajectory optimization, rope shape control, etc.), as well as applications in robotic surgery (soft tissue, membrane, blood, and tools).
  - Employing the adjoint method based on chain-rule and Autodiff tools to establish differentiability for the PBD simulation.
  - Creation of a constrained-based solver and software architecture in conjunction with NVIDIA Flex and Warp.
  - Implementing real-to-sim transfer techniques involving non-rigid perception, registration, and tracking.

- Designing closed-loop controller, motion planning and validation using real robots, includes da Vinci Research Kit (DVRK), 7-dof Baxter Arm, 7-dof Franka Panda Arm, a catheter robot, a non-holonomic mobile robot, a hydraulic-driven underwater robotic arm, haptic devices.
- Leading the **Continuum Robot Project**, which involves shape reconstruction through the projection of geometrical primitives (cylinders, circles, etc.), differentiable rendering, and executing visual servoing control.

**Biorobotics Institute, Scuola Superiore Sant'Anna**

**Apr. 2019 – Nov. 2019**

Senior Research Associate/Postdoc, Assistive Robotics Lab

Pisa, Italy

- Conducted Simultaneous Localization and Mapping (SLAM) for a mobile robot with ROS.
- Implemented autonomous vision-based self-initialization approach with aruco markers.
- Executed autonomous navigation with path planning and obstacle avoidance.
- Developed and implemented shared control theory for the mobile robot.
- Designed a PHP/HTML-based web user interface for control.
- Conducted experimental tests with real robots at a hospital in Verona, Italy.

**Bioinspired Soft Robotics@SSSA**

**Mar. 2018 – Apr. 2019**

Research Associate/Postdoc, Istituto Italiano di Tecnologia

Pisa, Italy

- Implemented modeling and control for the KUKA LWR4+ robotic arm using ROS and Gazebo, including motion control, trajectory planning, and master-slave operations.
- Conducted modeling and control of a flexible continuum surgical tool, involving a static tension-deflection model, Euler-Lagrange dynamics, and port-Hamiltonian-based control.
- Analyzed various continuum structure prototypes, exploring design variations such as notches, single-backbone configurations, and articulated structures.
- Developed a teleoperation framework using haptic devices (Sigma.7).
- Conducted a preliminary study of a simulation platform for flexible surgical tools using SOFA (Simulation Open Framework Architecture).

**Senior Control Engineer & Project Director**

**Oct. 2016 – Feb. 2018**

ROBO Medical Technology Co., Ltd

Shenzhen, China

- Led the development of teleoperation for a single-port abdominal robotics surgical system using haptic devices (PHANTOM Omni, Novint Falcon, Omega.3) and joysticks (Logitech G Extreme 3D, Microsoft Xbox).
- Modeled and controlled a tendon-driven articulated end-effector and 4 DOFs positioning arm (parallel mechanisms), covering kinematics, motion planning, and master-slave control.
- Identified and compensated model-based uncertainties, such as hysteresis and friction.
- Calculated the Remote Center of Motion (RCM) point for the positioning arm.

**PHD Thesis: Dual-user Haptic Training System**

**Sep. 2012 – Sep. 2016**

Advisors: Prof. Tanneguy Redarce, Prof. Arnaud Lelevé, Dr. Damien Eberard

Lyon, France

- Researched on control theories and modeling for haptic teleoperation with time delays.
- Proposed shared control frameworks for managing dual-user authority with the analysis of stability and transparency.
- Developed real-time experiments using Matlab/Simulink, ROS, and Chai3D.
- Published several international conference papers and journal papers.

**Master Thesis: Cooperative Haptic Hands-on MIS Trainer**

**Sep. 2012 – Aug. 2013**

Internship at Ampère Laboratory

INSA de Lyon, France

- Designed a teleoperation system using a port-Hamiltonian approach.
- Implemented control algorithms with haptic devices (PHANTOM Omni).
- Conducted real-time experiments using Matlab/Simulink.

### Undergraduate Thesis

Sep. 2011 – Jun. 2012

Laboratory Research Assistant

NPU, Xi'an, China

- Implemented image processing and classification algorithms.
- Extraction of image metadata features for retrieving images based on content and context.

### Funded Student Project by Chinese Ministry of Education

Nov. 2010 – Jun. 2012

Project Leader

NPU, Xi'an, China

- Implemented statistical and computing algorithms related to data mining (SVM etc).
- Implemented path planning algorithms for a mobile robot ( $A^*$ , RRT, RRT\*).

## Competitions & Awards

### DJI RoboMasters Mobile Manipulation Challenge

Aug. 2014

Team Leader

Shenzhen, China

*Dajiang Innovations Technology Co., Ltd (DJI)*

- Design of autonomous mobile robot using SLAM and ROS.
- Implemented fast on-board object tracking and recognition algorithms.
- Developed multi-robot coordination and searching algorithms.

### International Aerial Robotics Competition (IARC)

Aug. 2012

Team Leader

Peking, China

- Mathematical modeling of a self-made low-cost laser rangefinder based on geometric calculation for environment mapping.
- Autonomous control of the quadrotor using environment mapping and detection algorithms (wall and window detection using point cloud analysis).
- Awarded **Innovative Design**.

### International Mathematical Contest in Modeling (MCM)

Feb. 2012

Team Leader

NPU, Xi'an, China

- Optimal Design of U-shaped Snowboard Course
- Awarded **Meritorious Winner** (First Prize Mention).

### Robocup 3D Simulation Group

Sep. 2010 – Jun. 2012

Team Leader

NPU, Xi'an, China

- Designed gait algorithm of simulated NAO (Humanoid) robot.
- Developed control strategies for simulated soccer competition under the Linux platform.
- Awarded **Third Prize** in China Open 2011.

### “Freescale Cup” National Smart Car Design Competition

Dec. 2010 – May. 2011

Team Leader

NPU, Xi'an, China

- Design and control of an intelligent car for path following
- Awarded **Third Prize** in NPU Open 2011.

## Academic Services

### Journal Reviewer

- IEEE Transactions on Robotics (T-RO)
- IEEE Transactions on Mechatronics (T-MECH)
- IEEE Robotics and Automation Letters (RAL)
- IEEE Transactions on Medical Robotics and Bionics
- The International Journal of Robotics Research (IJRR)
- Control Engineering Practice
- Robotica
- Journal of Mechanisms and Robotics (JMR)

### Conference Reviewer

- International Conference on Robotics and Automation (ICRA)
- International Conference on Intelligent Robots and Systems (IROS)
- American Control Conference (ACC)
- International Conference on Learning Representations (ICLR)
- IFAC Workshop on Lagrangian and Hamiltonian Methods for Nonlinear Control (LHMNC)
- IEEE RAS/EMBS Conference on Biomedical Robotics and Biomechanics (BioRob)

## Grants

### **CAREER:** Contextually Informed Autonomous Robotic Surgery

*National Science Foundation (NSF)*

Mar. 2021 – Now

Postdoc Researcher (Grant No. : 2045803)

- Modeling and simulating the deformation of soft tissue alongside interactive control of robotic tools.
- Contribute to the grant writing process, meetings and reports.

### **EFRI C3 SoRo:** Safe Medical Continuum Robots: Sensing, Control and Fabrication

*National Science Foundation (NSF)*

Nov. 2019 – Jun. 2023

Postdoc Researcher (Grant No. : 1935329)

- Shape reconstruction of catheter robots using endoscopic images and visual-servoing control.
- Contribute to the meetings and reports.

### **National Key R&D Program of China:** Design and Kinematic Modeling of Modular Variable Stiffness Continuum Flexible Actuator

*Ministry of Science and Technology (MOST) of China*

Mar. 2019 – Nov. 2022

Sub-project Leader/PI: ROBO Medical Technology Co. Ltd (Grant No. : 2018YFB1307700)

- Modeling and control of a continuum flexible endoscopic submucosal dissection (ESD) robot using curvature-based approaches.
- Contribute to the grant writing process, meetings and reports.

### **National College Student Innovation and Entrepreneurship Training Program**

*Chinese Ministry of Education*

Nov. 2010 – Jun. 2012

Student Leader (10000 CNY)

## Mentoring Experiences

### PhD Students

**Xiao Liang**, CSE, UCSD

Sep. 2021 – present



- **Project:** Reconstruction of 4D lung motion using neural-ODE integration
  - **Achievement:** Published papers at TBME/IROS 2023, and submitted papers to ICRA 2024
- Yu Huan**, BioRobotics Institute, Scuola Superiore Sant'Anna Mar. 2018 - Mar. 2019
- **Project:** Design and control of flexible miniature surgical tools (continuum robot)
  - **Achievement:** Published papers at IEEE TBME/TMECH

### Master Students

- Yutong Zhang**, CSE, UCSD Jan. 2021 – present
- **Project:** Simulation of position-based dynamics for various objects (rigid, cloth, deformable) and rendering with libIGL/OpenGL
  - **Achievement:** Submitted papers to ICRA 2024
- Chung-Pang (Ben) Wang**, CSE, UCSD Sept. 2023 – present
- **Project:** SE(3)-Equivariant mappings for data-efficient learning of robot trajectory
- Wangyi Liu**, ECE, UCSD July 2022 – Aug 2023
- **Project:** SE(3)-Equivariant mappings for data-efficient learning of robot trajectory
  - **Achievement:** Currently working on a paper for IEEE RAL
- Alexander Luke**, MAE, UCSD Sep. 2021 – Jun. 2023
- **Project:** Motion control and calibration of a steerable continuum robotic catheter with clinical trials
  - **Achievement:** Successfully conducted demos with animal trials
- Junming Wu**, ECE, UCSD Sep. 2021 – Dec. 2022
- **Project:** Bi-manual close-loop control of dual-arm suturing using physical-based simulation
  - **Achievement:** Successfully conducted demos on the dVRK robot
- Haaris Rahman**, CSE, UCSD Sep. 2021 – Mar. 2022
- **Project:** Reconstruction of deformable soft tissue using occupancy flow
  - **Achievement:** Successfully conducted demos in our PBD simulator
- Chong He**, MAE, UCSD Sep. 2021 – Aug. 2022
- **Project:** Shape reconstruction of catheter robot using monocular images
  - **Achievement:** Drafted a paper for IEEE RAL
- Yunhai Han**, MAE, UCSD Jan. 2021 – Jan. 2022
- **Project:** Deformable objects simulation framework using a constraints-based solver
  - **Achievement:** Published a paper at ICRA 2021/IROS 2021
- Mingen Li**, ECE, UCSD Jan. 2021 – Jan. 2022
- **Project:** Simulation and control of articulated robots using position-based dynamics
  - **Achievement:** Submitted a paper to IEEE TRO
- Entong Su**, ECE, UCSD Jan. 2021 – Jan. 2022
- **Project:** Simulation and control of rope-like objects using position-based dynamics
  - **Achievement:** Published a paper at IEEE RAL
- Harleen Singh**, ECE, UCSD Jan. 2020 – Jul. 2021
- **Project:** Modeling of the continuum catheter robot for motion control
  - **Achievement:** Successfully conducted demos with live animal trials
- Zihan Li**, ECE, UCSD Jan. 2020 – Nov. 2020
- **Project:** Real-to-sim registration of deformable tissue with correspondance-free SDF
  - **Achievement:** Published a paper at ICRA 2021

## Undergraduate Students

- Yuelei (Tina) Li**, Mathematics, UCSD Apr. 2023 – present
- **Project:** Intrinsic neural mappings from mesh to point cloud for soft tissue tracking
  - **Achievement:** Submitted a paper to ICRA 2024
- Neelay Joglekar**, ECE, UCSD Jan. 2021 – present
- **Project:** Modeling dynamical behavior of rope-like objects using cosserat rod theory, and surgical thread reconstruction with splines
  - **Achievement:** Published a paper at ICRA 2023
- Bryan Yuan**, ECE, UCSD Jan. 2021 – May 2022
- **Project:** Computation of backward gradients for position-based dynamics constraints
  - **Achievement:** Integrated into our PBD simulator
- Nemanja Babic**, Research Internship, University of Ottawa & INSA de Lyon 2015
- **Project:** Simulating haptic systems using CHAI3D
  - **Achievement:** Conducted demos with simulations in CHAI3D

## High School Students

- Ayaan Haque**, Saratoga High School, California Jan. 2021 – Jul. 2021
- **Project:** Simulation through algorithmic force coefficient estimation
  - **Achievement:** Published a paper at IEEE ACIRS 2021
- Sajiv Shah**, Saratoga High School, California Jan. 2021 – Jul. 2021
- **Project:** Simulation through algorithmic force coefficient estimation
  - **Achievement:** Published a paper at IEEE ACIRS 2021

## Languages

**English:** Advanced, Fluent

**Chinese:** Native

**French:** Beginner A2