JINCHEN RUAN

(332) 999 8814 | jr4521@columbia.edu | linkedin.com/in/ruanjinchen | ruanjinchen.github.io

EDUCATION

Columbia University — New York, NY
M.S. in Mechanical Engineering with Concentration in Robotics and Control — Sep 2024 - Present
GPA: 3.96/4

Beijing University of Technology — Beijing, CN
Bachelor of Engineering in Robotics Engineering — Sep 2019 - Jun 2023
GPA: 3.38/4

PUBLICATIONS

ArticFlow: Generative Simulation of Articulated Mechanisms
*Jiong Lin, **Jinchen Ruan**, Hod Lipson* — *Submitted to CVPR 2026*

Flow-Based Self-Modeling of Tendon-Driven Continuum Robots
***Jinchen Ruan**, Jiong Lin, Hod Lipson* — *Submitted to RSS 2026*

RESEARCH EXPERIENCE

Creative Machines Lab at Columbia University — New York, NY
Research Assistant — Jan 2025 - Present

- ArticFlow: Developed a two-stage flow-matching generative model for articulated mechanisms that couples a latent flow and a point flow to synthesize action-conditioned 3D point clouds, achieving up to an 84.3% reduction in Earth Mover's Distance compared with baseline methods on articulated objects.
- Flow-based self-modeling of tendon-driven continuum robots: Designed new tendon-driven continuum robot hardware and the corresponding MuJoCo simulation with hybrid model-based and learning-based control; trained a flow-matching self-model that maps motor states to external 3D point clouds, achieving a Chamfer Distance of 0.136 mm on normalized simulation point clouds and 0.595 mm on real-world datasets.

Institute of Automation, Chinese Academy of Sciences — Beijing, CN
Research Assistant — Oct 2023 - May 2024

- Built a mobile platform for a dual-arm robot and designed the motion control of both the mobile chassis and the dual-arm robot under ROS 2, achieving 50% higher inverse-kinematics accuracy than MoveIt 2.
- Achieved a 60% success rate using neural networks to train robotic arms and dexterous hands for autonomous fine assembly.
- Reproduced ALOHA and GELLO, and completed simple household tasks with DMP, achieving a 90% success rate in opening doors and retrieving items from the fridge.

WORK EXPERIENCE

Mech-Mind Robotics Technologies Co., Ltd. — Beijing, CN
Testing Engineer — Nov 2022 - Mar 2023

- Conducted comprehensive testing of machine-vision software to ensure optimal performance and functionality, and implemented necessary fixes and improvements with the development team.
- Managed image acquisition for industrial cameras, analyzing and evaluating post-processing algorithms.
- Executed hand–eye calibration testing for various robotic arms and cameras within third-party vision software systems, achieving a 100% success rate in grasping validation tests.
- Collaborated with team members to design and implement communication protocols for collaborative robotic arms, enhancing overall system efficiency and reliability.

Beijing Century TAL Education Technology Co., Ltd. — Beijing, CN
New Media Operations Supervisor — Jun 2019 - Sep 2020

- Compiled weekly content for the WeChat public account to engage students, parents, and the wider community, reaching over 100,000 students and parents. Oversaw the operation of various social media platforms and online channels to promote the department and its offerings.

- Organized and conducted quarterly meetings for the department, including planning agendas, coordinating with speakers, and providing technical assistance and troubleshooting support for the online course platform.
- Designed and produced engaging visual materials, such as posters and videos, to support departmental initiatives and promote events and courses.

PROJECTS

Motion Planning with Multi-Sensor Information Fusion *2019*
- Applied Python and C++ programming skills to develop and debug mobile-platform navigation, visual recognition, robot assembly, robot-arm motion planning, and multi-sensor fusion modules.
- Applied Python and Cypher to build a Neo4j graph database and perform various assembly tasks using it. Authored two invention patents that were granted.

Biped Dinosaur-Shaped Robot for Robotics Studio *2024*
- Designed a biped dinosaur-shaped robot from scratch, including the overall body geometry and transmission mechanism, as part of the Robotics Studio course at Columbia University.
- Fabricated the robot in the Columbia MakerSpace using 3D printing, laser cutting, machining, and soldering to integrate structural and actuation components.
- Built a MuJoCo simulation and implemented basic control to achieve running behavior, achieving a running speed of 16.0528 cm/s on the physical robot.

SKILLS

- Full proficiency: Linux Ubuntu, SolidWorks, Ae, Pr, Ps, Au, Lr, Office.

- Programming: Python, C, C++, ROS/ROS2.