

DONGXIAO YANG

500 W 120 St NY 10027

(917)8254603
dy2462@columbia.edu

EDUCATION

Columbia University

New York

M.S. of Mechanical Engineering

Expected May 2024

- Advanced Master's Research Program on Robotics and Control track.
- GPA: 4.0 / 4.0.

Shanghai Jiao Tong University

Shanghai, China

B.E. of Mechanical Engineering

Graduated Aug 2022

- GPA: 3.7 / 4.0.
- John Wu and Jane Sun Excellence Scholarship for 2020-2021 Academic Year (top 1%).

WORK EXPERIENCE

Columbia University

New York

Research Assistant of Robot Manipulation and Mobility (ROAM) Lab.

May 2023 - Present

- Participated in research work regarding robot learning and manipulations (see Research section for details).
- Develop assignment codes for Applied Robotics course and auto-grading scripts. Course materials include ROS II, cartesian control, motion planning, Kalman filter, and dynamics engine.

Tesla Motor

Shanghai, China

Mechanical Engineer Intern

Feb 2022 - May 2022

- Designed, optimized and integrated fasteners and joints on Body in White; supported production of new parts with suppliers.
- Led experiments to verify sealing performance of a new design to reduce part weight by 20% and saved production cost of \$80,000 per year.

RESEARCH

Columbia University: Learning Dexterous Manipulation with a 4-Finger Robotic Hand Kinematics Robot Manipulation and Mobility (ROAM) Lab.

Jan 2024 - Present

- Individually build the IsaacGym and reinforcement learning environment.
- Adapt a PPO + Actor-Critic mode and an RRT sampling technique to train the finger-gaiting policy. Compute and use the volume of the wrench space convex hull as the reward function to train the pinch-to-power grasp transfer.

Columbia University: Tactile-Based Object Retrieval from Granular Media (<https://jxu.ai/geotact/#>) Robot Manipulation and Mobility (ROAM) Lab.

May 2023 - Feb 2024

- Deployed and validated the policy (trained in IsaacGym) and on the real-world hardware, including the integration of a parallel gripper control and tactile fingers (ROS-based system), along with a UR5 robot control using the RTDE interface.
- Conducted system identification and safe deployment for sim-to-real transfer. Achieved 68% overall success rate on 7 trained objects and generalized to 28 unseen objects; designed and evaluated baseline policies.

Shanghai Jiao Tong University & State Grid China: Bolt Tightening Robot for Power Transmission Tower

Sep 2021 - Aug 2022

- Led a team to design and prototyped a 3-legged mechanism to climb on a power transmission tower (2.2 m) and tighten the bolts with torque larger than 50 Nm.
- Individually coded the control program based on Raspberry Pi and TCP protocol.

SKILLS

- Language: English (Fluent), Chinese (Native).
- Programming language: Python, Matlab, C++ (C), Assembly, Bash.
- Physics engine and simulator: Blender, IsaacGym, Pybullet.
- Computer aided design: Solidworks, Onshape, Blender, Catia.
- Familiar with motor and sensor controls.
- Familiar with Ubuntu Linux OS, ROS (I & II), and Github tools.
- Familiar with machine learning and reinforcement learning applications.

PUBLICATIONS

- Jingxi Xu*, Yinsen Jia*, **Dongxiao Yang***, Patrick Meng, Xinyue Zhu, Zihan Guo, Shuran Song, Matei Ciocarlie. "Tactile-Based Object Retrieval from Granular Media." *IEEE Transactions on Robotics*. *Authors contributed equally. arXiv: <https://arxiv.org/abs/2402.04536>.
- **Dongxiao Yang**, Shaopeng Jiang, Shibo Wang, Aowei Zhao, Youyi Bi. "Design of A Bolt Tightening Robot for Power Transmission Tower." *IEEE Transactions on Power Delivery*.