

YAN ZHANG

✉ yaanzhang@outlook.com — [Website](#) — [Google Scholar](#) — [GitHub](#) — ☎ (+41) 77-276-5700

RESEARCH PROFILE

Robotics researcher developing efficient and robust methods for long-horizon, contact-rich manipulation. My work combines task and motion planning, contact reasoning, compliant control, and adaptive robot learning to generate behaviors that remain feasible under task and physical variations, reducing unnecessary replanning and enabling reliable real-world deployment.

RESEARCH EXPERIENCE

Toyota Research Institute (TRI)

Robotics Intern, Mobile Manipulation

Los Altos, CA, USA

Jun. 2026–Dec. 2026

- **Adaptive robot learning for deployment:** adapted and deployed a human-in-the-loop online reinforcement learning framework for contact-rich robotic assembly on a real mobile dual-arm platform.
- **Robust contact-rich manipulation:** evaluated the learned insertion policy under randomized initial object positions and characterized the range over which the policy reliably completes the task.
- Built an automated real-robot training pipeline that learns the target insertion task in approximately **1 hour**, substantially reducing manual intervention during training and resetting.
- *Platforms/Tools:* Kinova Gen3 dual-arm mobile platform, force/torque sensor, Visual-SLAM, JAX, Pytorch.

Idiap Research Institute / EPFL

Research Assistant / PhD Candidate, [Robot Learning and Interaction Group](#)

Martigny, Switzerland

Oct. 2022–Oct. 2026

- **Efficient long-horizon manipulation:** developed learning-guided task and motion planning methods that extract reusable task structure from demonstrations to accelerate geometrically feasible multi-object manipulation planning and replanning. **[J1]** Logic-LfD (RA-L'24), **[J2]** Learn2Decompose (RA-L'25, ICRA'26 Oral).
- **Robust contact-rich manipulation:** developed and contributed to whole-arm, caging-based, and robustness-aware planning methods for manipulation under geometric constraints, disturbances, and model mismatch. **[J4]** Eikonal Caging, **[C2]** RDF (ICRA'24), **[C3]** Robustness-Aware Tool Selection (ICRA'26 Poster).
- Validated these methods on long-horizon household/kitchen, tool-use, and whole-arm manipulation tasks, including real-robot experiments with Franka manipulators.
- *Platforms/Tools:* Franka Emika, ROS, PyBullet, MuJoCo, PyTorch.

Tencent Robotics X Lab

Research Intern, Intelligent Agent Center

Shenzhen, China

Oct. 2021–Jan. 2022

- **Adaptive robot learning for deployment:** designed and evaluated Sim2Real transfer of deep reinforcement learning policies for quadruped locomotion learned from animal demonstrations.
- Investigated policy architectures and simulation/environment factors affecting robustness and generalization, and successfully transferred learned locomotion behaviors from simulation to a real quadruped robot.
- *Platforms/Tools:* Custom quadruped robot, ROS, Gazebo, PyBullet, PyTorch.

Xi'an Jiao Tong University (XJTU)

Research Assistant, Institute of Robotics and Intelligent Systems

Xi'an, China

Jul. 2019–Aug. 2022

- **Robust contact-rich manipulation:** developed variable-impedance manipulation policies from human demonstrations using imitation learning and reinforcement learning for compliant physical interaction. **[C1]** Variable Impedance Manipulation Skills (AIM'22).

- **Adaptive robot learning for deployment:** developed and deployed residual reinforcement learning on real robot arms for compliant assembly, combining nominal motion policies with learned residual corrections.
- Implemented and evaluated continuous-control reinforcement learning algorithms including DDPG, TD3, SAC, and PPO, establishing a foundation in deep reinforcement learning and policy optimization.
- *Platforms/Tools:* Franka Emika, ROS, MuJoCo, PyBullet, PyTorch, Python/C++.

SELECTED PUBLICATIONS

* indicates equal contribution

- [J4] **Zhang, Y.**, Li, Y., Dong, Y., Pokorny, F. T., Calinon, S. (2026), *Physics-informed Eikonal Caging for Whole-arm Manipulation Planning*, manuscript under review. [\[PDF\]](#)
- [J3] Xue, T., **Zhang, Y.***, Razmjoo, A. *, Calinon, S. (2025), *Unifying Robot Optimization: Monte Carlo Tree Search with Tensor Factorization*, Submitted to IJRR. [\[PDF\]](#)
- [J2] **Zhang, Y.**, Xue, T., Razmjoo, A., Calinon, S. (2025). *Learn2Decompose: Learning Problem Decomposition for Efficient Sequential Multi-object Manipulation Planning*. IEEE RA-L & ICRA 2026 Oral. [\[PDF\]](#) [\[Website\]](#)
- [J1] **Zhang, Y.**, Xue, T.*, Razmjoo, A. *, Calinon, S. (2024). *Logic Learning from Demonstrations for Multi-step Manipulation Tasks in Dynamic Environments*. IEEE RA-L. [\[PDF\]](#) [\[Website\]](#)
- [C3] Dong, Y.*, **Zhang, Y.***, Calinon, S., Pokorny, F.T. (2026). *Robustness-Aware Tool Selection and Manipulation Planning with Learned Energy-Informed Guidance*. ICRA. [\[PDF\]](#)
- [C2] Li, Y., **Zhang, Y.**, Razmjoo, A., Calinon, S. (2024). *Representing Robot Geometry as Distance Fields: Applications to Whole-body Manipulation*. ICRA. [\[PDF\]](#) [\[Website\]](#)
- [C1] **Zhang, Y.**, Zhao, F., Liao Z. (2022). *Learning and Generalizing Variable Impedance Manipulation Skills from Human Demonstrations*. IEEE/ASME AIM. [\[PDF\]](#)

EDUCATION

Ecole Polytechnique Fédérale de Lausanne (EPFL)	Lausanne, Switzerland
Ph.D. in Electrical Engineering	Oct. 2022–Expected Jun. 2027
<i>Thesis: Towards Efficient and Robust Multi-Object Manipulation Planning with Robot Learning</i>	
Advisor: Dr. Sylvain Calinon	
Xi'an Jiao Tong University (XJTU)	Xi'an, China
M.Sc. in Mechanical Engineering	Sept. 2019–Jun. 2022
<i>Thesis: Robot Learning Variable Impedance Manipulation Skills with Multi-Modal Demonstrations</i>	
Ecole Centrale de Lille (ECLille)	Lille, France
M.Eng. in General Engineering, Double-Degree Program with XJTU	Sept. 2017–Sept. 2022
Xi'an Jiao Tong University (XJTU)	Xi'an, China
B.Eng. in Mechanical Engineering	Aug. 2015–Sept. 2019

TECHNICAL SKILLS

Research:	Task & Motion Planning, Reinforcement/Imitation Learning, Trajectory Optimization, Online RL/Sim2Real, Differentiable Simulation, Compliant Control
Programming/ML:	Python, C++, PyTorch, PDDL, JAX, Flax
Robotics/Simulation:	ROS, MuJoCo, PyBullet, Genesis
Tools:	Linux, Git, LaTeX
Languages:	Chinese (native), English (IELTS 7.5), French (DALF C1)
Service:	Reviewer for IEEE RA-L, ICRA, IJRR