Jing (Daisy) Dai

daisy_dai@sjtu.edu.cn | Shanghai 200240, China | daisydai008.github.io

Education

Shanghai Jiao Tong University *Shanghai*
Master in Mechanical Engineering | Advisor: Weixin Yan Sep. 2023 - Jun. 2026 (Expected)
GPA: 3.6 / 4.0

Hunan University *Changsha*
Bachelor in Mechanical Design, Manufacturing and Automation Sep. 2019 - Jun. 2023
GPA: 3.66 / 4.0 (ranking: 15/248, top 6%)

Research Statement

My research focuses on robot learning with concrete hardware implementations, bridging mechatronics and AI to enable dexterous manipulation. With experience spanning from embedded systems to RL algorithms, I bring a unique hardware-software co-design perspective essential for advancing embodied intelligence. I thrive in cross-disciplinary teams, having collaborated with engineers, researchers, and designers across academia and industry.

Publications

[1] **Jing Dai**, Jianbo Yuan, Yiwen Lu, Haohua Zhu, Sheng Yi, and Weixin Yan. "IntuitCap: A 60-DOF Upper-body Motion Capture System for Dexterous Robot Manipulation". Accepted by 8th The International Conference on Robotics, Control and Automation Engineering (RCAE), 2025.

[2] **Jing (Daisy) Dai***, Qianshu Wang*, Shurui Zhang*, Bin Zhao, Jiahong Zhang, Jianbo Yuan, and Yiwen Lu. "HOVER: Generalized Retargeting for Dexterous Manipulation". To be presented at IROS 2025 Workshop on Learning from Human Teleoperation; *In preparation for* Robotics: Science and Systems (RSS), 2026. (*equal contribution)

[3] Xinyue Xu*, Jieqiang Sun*, **Jing (Daisy) Dai***, Siyuan Chen, Lanjie Ma, Ke Sun, Bin Zhao, Jianbo Yuan, and Yiwen Lu. "DexCanvas: Bridging Human Demonstrations and Robot Learning for Dexterous Manipulation". Submitted to International Conference on Learning Representations (ICLR), 2026. (*equal contribution)

[4] Yuchen Jia, Suzhen Wu, Gang Wang, **Jing Dai**, Jingyuan Gao, Rui Lei, and Aonan Li. "A Bionic Peacock", *Invention Patent*, ZL116423533A, 2023-07-14. [Link]

Research Projects

Task-Centric Reinforcement Learning for High-DOF Dexterous Hands *Shanghai*
Research Intern | DexRobot Inc. Feb. 2025 – Present

Advancing dexterous manipulation through task-centric RL applied to high-DOF robotic hands. Leveraging real-to-sim human demonstrations and large-scale datasets for robust skill transfer.

- **HOVER retargeting framework** (IROS 2025 Workshop; RSS 2026 in preparation): First-author equal contribution to virtual operator methodology for human-to-robot retargeting that achieves both task fidelity and anthropomorphism; demonstrated 30% efficiency improvement in real-world teleoperation on DexHand021
- **DexCanvas dataset** (submitted to ICLR 2026): Equal contribution to large-scale hybrid dataset combining 70 hours real mocap with physics-validated synthetic expansion; developed RL-based force extraction methodology producing 7,000 hours of physically consistent manipulation data across 21 manipulation types from Cutkosky taxonomy
- **Simulation setup**: Constructed simulation scenes in MuJoCo and Isaac Gym; deployed benchmark datasets such as ARCTIC to evaluate manipulation accuracy and generalization
- **Policy deployment**: Implemented hardware and control integration for the 19-DOF DexHand 021, enabling adaptive in-hand manipulation under dynamic contact conditions

Upper Limb 60-DOF Data Acquisition and Digital Twin System *Shanghai*

Engineering Intern | DexRobot Inc. Sep. 2024 – Mar. 2025

Engineered a 60-DOF upper-limb capture system that enables real-time teleoperation for high-fidelity human demonstration capture

- **Mechanical Design:** Designed lightweight exoskeleton using 3D-printed nylon structures, integrating magnetic encoders for joint angle sensing and smart gloves with tactile feedback for hand motion capture
- **Embedded Systems:** Implemented Socket and CANFD bus communication for low-latency peripheral device control and data streaming, achieving 10ms end-to-end latency
- **Robot Kinematics & Control:** Implemented kinematic modeling and mapping algorithms to reconstruct operator motion. Created Unity3D-based digital twin environment for real-time teleoperation of dual-arm JAKA robots and DexHand 021 systems

Bionic Robotic Peacock *Changsha*

National First Prize, Mechanical Innovation Design Competition | Advisor: Gang Wang May 2022 – Aug. 2022

Engineered a bionic robotic peacock with embedded control, multi-axis actuation, and voice interaction for educational exhibition

- Architected embedded control system based on dual STM32 microcontrollers, programmed in embedded C using Keil IDE, with modular architecture supporting coordinated actuation of 11 motors
- Programmed complex motion behaviors (tail spreading, wing retracting, dancing, walking) through heterogeneous motor control: servo motors for tail and legs, brushless DC motors for neck and wings
- Integrated real-time voice control via LU-ASR01 speech recognition module; conducted three design iterations to optimize motion smoothness and structural reliability

Teaching Experience

Teaching Assistant | Introduction to Robotics *Shanghai*

Shanghai Jiao Tong University Spring 2025

- Taught kinematics, dynamics, and control systems through interactive lab sessions
- Mentored 30+ students on robotic system design projects bridging theory and implementation

Skills

Programming	Matlab, Python, C, C++, Qt
Professional Software	SOLIDWORKS, UG NX, Simulink
Robotics Technology	ROS, Simulators (MuJoCo, Isaac Gym, Unity), Deep Learning (PyTorch)
Drawing & Typesetting	MS Office, Photoshop, LaTeX, Markdown
Languages	Chinese (Native), English (IELTS: 7)

Selected Honors & Activities

2020	**National Scholarship** (Top 0.2% nationwide)	*Changsha*
2022	**National First Prize**, 10th National College Mechanical Innovation Design Competition	*Shenzhen*
2025	**Trane Technologies Future Star Women Engineers Scholarship**	*Shanghai*
2023	**Outstanding Graduate of Hunan University**	*Changsha*
2022	**Honorable Mention Prize**, Mathematical Contest in Modeling (MCM)	*USA*

Leadership & Service: New Media Center Director, SJTU-ME Student Union (2023-2025) | Peer Mentor, Hunan University (2021-2023)