

# Yao Su

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## RESEARCH INTERESTS

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Robotics, UAV, Humanoid, Control and System, Locomotion, Optimization, Planning, Dynamics

## EDUCATION

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University of California, Los Angeles	Los Angeles, CA
Ph.D. in Mechanical Engineering	09/2017-06/2021
Mechatronics and Control Laboratory (MacLab), Advisor: Dr. Tsu-Chin Tsao	
M.S. in Mechanical Engineering	09/2016-06/2017
Robotics and Mechanisms Laboratory (RoMeLa), Advisor: Dr. Dennis Hong	
Overall GPA: 3.87/4.0	
Harbin Institute of Technology	Harbin, China
B.S in Mechanical Engineering and Automation	09/2012-06/2016
State Key Laboratory of Robotics and System, Advisor: Dr. Yili Fu	
Overall GPA: 3.83/4.0      Major GPA: 3.92/4.0	

## APPOINTMENTS

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State Key Laboratory of General Artificial Intelligence, Beijing Institute for General Artificial Intelligence(BIGAI)	
Research Scientist in Robotics	06/2021–Present

## PUBLICATIONS

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### Under Review

- [C14] Li, Z.\* , Niu, Y.\* , **Su, Y.**, Liu, H., Jiao, Z.# (2024). Dynamic Planning for Sequential Whole-body Mobile Manipulation. IEEE Conference on Industrial Electronics and Applications (ICIEA).
- [J14] Zhang, T., He, X., Han, M., **Su, Y.**#, Zhang, Z.# , Zhu, S. (2024). Multi-Agent Joint Task Planning in Symmetrical Reality. IEEE Robotics and Automation Letters (RA-L).
- [J13] He, Z., Wu, J., Zhang, S., Zhang, J., Sun, L., **Su, Y.**#, Leng, X.# (2024). CDM-MPC: An Integrated Dynamic Planning and Control Framework for Bipedal Robots Jumping. IEEE Robotics and Automation Letters (RA-L).
- [J12] **Su, Y.**\*, Jiao, Z.\* , Li, J., Wang, M., Li, H., Zhang, J., Zhu, Y., Zhu, S., & Liu, H.#(2024). Design, Planning, and Control of an Over-actuated Aerial Manipulator for Sequential Manipulation. IEEE Transactions on Robotics (TRO).
- [C13] Qian, Y., Yu, P., Wu, Y., **Su, Y.**, Wang, W.# , & Fan, L.# (2024). Learning Concept-Based Visual Causal Transition and Symbolic Reasoning for Visual Planning. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).
- [C12] Wang, M.\* , Li, W.\* , Liang, H., Li, B., Althoefer K., **Su, Y.**#, & Liu, H.#(2024). Large-scale Vision-based Tactile Sensor Deployment on Multi-fingered Grippers. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).
- [C11] **Su, Y.**, Jiao, Z., Zhang, Z., Zhang, J., Li, H., Wang, M., & Liu, H. (2024). Flight Structure Optimization of Modular Reconfigurable UAVs. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).

**Journal Paper** (\*indicates joint first authors, # indicates joint corresponding authors)

- [J11] Fu, Y., **Su, Y.**, Wei, J., Wang, B., Li, J. (2024). Auto-focusing Femtosecond Laser Manufacturing System via Acoustic Emission Technology. *Optics Letters*, 49, 558-561. DOI: 10.1364/OL.516076
- [J10] Yu, P.\*, **Su, Y.\***, Gerber, M. J., Ruan, L., & Tsao, T. C. (2023). Compensating Aerodynamics of Over-actuated Multi-rotor Aerial Platform with Data-driven Iterative Learning Control. *IEEE Robotics and Automation Letters (RA-L)*, 8(10), 6187-6194. DOI: 10.1109/LRA.2023.3304539.
- [J9] Li, W.\*, Wang, M.\*, Li, J., **Su, Y.#**, Jia, D.K., Qian, X., Althoefer K., & Liu, H.# (2023). L3 F-TOUCH: A Wireless GelSight with Decoupled Tactile and Three-axis Force Sensing. *IEEE Robotics and Automation Letters (RA-L)*, 8(8), 5148-5155. DOI: 10.1109/LRA.2023.3292575.
- [J8] **Su, Y.\***, Yu, P.\*, Gerber, M. J., Ruan, L., & Tsao, T. C. (2024). Fault-Tolerant Control of an Over-actuated UAV Platform Built on Quadcopters and Passive Hinges. *IEEE/ASME Transactions on Mechatronics (TMECH)*, 29(1), 602-613. DOI: 10.1109/TMECH.2023.3288032.
- [J7] Ruan, L.#, Pi, C.\*, **Su, Y.#**, Yu, P., Cheng, S., & Tsao, T. C. (2023). Control and experiments of a novel tilttable-rotor aerial platform comprising quadcopters and passive hinges. *Mechatronics*, 89, p.102927. DOI: 10.1016/j.mechatronics.2022.102927.
- [J6] **Su, Y.**, Jiang, Y., Zhu, Y., & Liu, H. (2021). Object Gathering With a Tethered Robot Duo. *IEEE Robotics and Automation Letters (RA-L)*, 7(2), 2132-2139. DOI: 10.1109/LRA.2021.3141828.
- [J5] **Su, Y.\***, Ruan, L.\*, Yu, P.\*, Pi, C. H., Gerber, M. J., & Tsao, T. C. (2021). A Fast and Efficient Attitude Control Algorithm of a Tilt-Rotor Aerial Platform Using Inputs Redundancies. *IEEE Robotics and Automation Letters (RA-L)*, 7(2), 1214-1221. DOI: 10.1109/LRA.2021.3138806.
- [J4] **Su, Y.\***, Yu, P.\*, Gerber, M. J., Ruan, L., & Tsao, T. C. (2021). Nullspace-Based Control Allocation of Overactuated UAV Platforms. *IEEE Robotics and Automation Letters (RA-L)*, 6(4), 8094-8101. DOI: 10.1109/LRA.2021.3095035.
- [J3] Yu, P.\*, **Su, Y.\***, Gerber, M. J., Ruan, L., & Tsao, T. C. (2021). An Over-Actuated Multi-Rotor Aerial Vehicle With Unconstrained Attitude Angles and High Thrust Efficiencies. *IEEE Robotics and Automation Letters (RA-L)*, 6(4), 6828-6835. DOI: 10.1109/LRA.2021.3095035.
- [J2] Luo, J., Gong, Z., **Su, Y.**, Ruan, L., Zhao, Y., Asada, H. H., & Fu, C. (2021). Modeling and Balance Control of Supernumerary Robotic Limb for Overhead Tasks. *IEEE Robotics and Automation Letters (RA-L)*, 6(2), 4125-4132. DOI: 10.1109/LRA.2021.3067850.
- [J1] Luo, J., **Su, Y.**, Ruan, L., Zhao, Y., Kim, D., Sentis, L., & Fu, C. (2019). Robust Bipedal Locomotion Based on a Hierarchical Control Structure. *Robotica*, 37(10), 1750-1767. DOI: 10.1017/S0263574719000237.

**Conference Paper** (\*indicates joint first authors)

- [C10] Zhou, K., Wu, P., **Su, Y.**, Gao, H., Ma, J., Liu, H., & Liu, C. (2024). ASPIRe: An Informative Trajectory Planner with Mutual Information Approximation for Target Search and Tracking. *IEEE International Conference on Robotics and Automation (ICRA)*.
- [C9] **Su, Y.\***, Zhang, J.\*, Li, H., Wang, M., & Liu, H. (2024). Real-time Dynamic-Consistent Motion Planning for Over-actuated UAVs. *IEEE International Conference on Robotics and Automation (ICRA)*.
- [C8] Gao, H., Wu, P., **Su, Y.**, Zhou, K., Ma, J., Liu, H., & Liu, C. (2024). Probabilistic Visibility Aware Trajectory Planning for Target Tracking in Cluttered Environments. *IEEE American Control Conference (ACC)*.
- [C7] Zhang, Z., Zhang, Z., Jiao, Z., **Su, Y.**, Liu, H., Wang, W., & Zhu, S. (2024). On the Emergence of Symmetrical Reality. *IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*.
- [C6] Wang, M.\*, **Su, Y.\***, Li, H., Li, J., Liang, J., & Liu, H. (2023). Aggregating Single-wheeled Modular Robots for Omnidirectional Movements. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*.

- [C5] **Su, Y.\***, Li, J.\*, Jiao, Z\*, Wang, M., Chu, C., Li, H., Zhu, Y., & Liu, H. (2023). Planning Sequential Aerial Manipulation for Over-actuated Unmanned Aerial Manipulators. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- [C4] **Su, Y.\***, Chu, C.\*, Wang, M., Li, J., Yang, L., Zhu, Y., & Liu, H. (2022). Downwash-aware Control Allocation for Over-actuated UAV Platforms. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).
- [C3] Pi, C., Ruan, L., Yu, P., **Su, Y.**, Cheng, S., & Tsao, T. C. (2021). A Simple Six Degree-of-Freedom Aerial Vehicle Built on Quadcopters. IEEE Conference on Control Technology and Applications (CCTA).
- [C2] Wang, M., **Su, Y.**, Liu, H., & Xu, Y. (2020). WalkingBot: Modular Interactive Legged Robot with Automated Structure Sensing and Motion Planning. IEEE International Conference on Robot and Human Interactive Communication (RO-MAN).
- [C1] Lin, X., Krishnan, H., **Su, Y.**, & Hong, D. W. (2018). Multi-limbed robot vertical two wall climbing based on static indeterminacy modeling and feasibility region analysis. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).

## Dissertation

Su, Y. "Compensation and control allocation with input saturation limits and rotor faults for multi-rotor copters with redundant actuations." PhD diss., University of California, Los Angeles, 2021.

## HONORS AND AWARDS

- IROS 2023 Best Paper Award on Mobile Manipulation--Finalist
- The Excellent Graduate of HIT (3%)
- The Second Prize of Summer Social Practice in HIT
- Merit Students for three times (6%)
- The First Prize Scholarship of "Accompanying Grows" (3%)
- People's Scholarship for eight times (3%)
- The Third-class scholarship of SMC (8%)

## INTERNSHIP

Robotics Engineer at DMAI, Los Angeles, CA 90024

01/2018-04/2020

## PERSONAL EXPERIENCE

- Recommended for admission to Harbin Institute of Technology (HIT) without examination 03/2012
- First Prize of National Olympiad in Informatics in Provinces, Hebei, China 11/2011
- Second Prize of National Olympiad in Informatics in Provinces, Hebei, China 11/2010

## SKILLS

- Programming:** Pascal, C, C++, VB, Python, Rasberry Pi, Arduino
- Simulation Tool:** ROS/Gazebo, Isaacgym, V-rep, Openai Gym/Mujoco, Webots
- Software:** MATLAB/Simulink, LabVIEW
- CAD:** AutoCAD, SolidWorks

## PERSONAL SERVICE

**Conference Reviewer:** IEEE IROS, ICRA, RSS, ACC, RO-MAN

**Journal Reviewer:** IEEE TRO, TMECH, RA-L,

ELSEVIER Mechatronics, Elsevier Robotics and Autonomous Systems