

# DAOTAN WANG

Beijing, China

wangdt23@mails.tsinghua.edu.cn

## EDUCATION

<b>Bachelor of Mechanical Engineering</b> , Tsinghua University	Aug 2023 - Jun 2027(Expected)
<b>Relevant Coursework:</b> System Dynamics and Control, Robot Engineering and Technology Applications, Micro-Computer Control for Mechanical Systems, Fundamentals of Electronics, Principles of Electric Circuits, Mechanical Design	

## PUBLICATION

Chuanyu Li*, Chaoyi Liu*, <b>Daotan Wang</b> , Shuyu Zhang, Lusong Li, Zecui Zeng, Fangchen Liu, Jing Xu†, Rui Chen†. ViTaMIn-B: A Reliable and Efficient Visuo-Tactile Bimanual Manipulation Interface.	IEEE Robotics and Automation Letters (RA-L), under review, 2025
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------

## PROJECTS

<b>Bimanual Visuo-Tactile Manipulation Interface based on Imitation Learning</b> Supervised by Prof. Rui Chen and Prof. Jing Xu	Feb 2025 - Feb 2026 <i>Tsinghua University</i>
------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------

- Designed a data acquisition system based on UMI, integrating the gripper of both hands, the visuo-tactile sensor, the Quest controller for recording trajectory, and a fisheye camera into a handheld device.
- Designed and implemented a hand–eye calibration pipeline between a Quest controller and a robotic end effector, including left-handed to right-handed coordinate system conversion; collected multi-pose calibration data to establish the spatial mapping and converted recorded handheld trajectories into end-effector relative motions for robot control and learning.
- Assisted in multimodal data fusion (vision, tactile point clouds, and trajectory signals), training a diffusion-based imitation learning policy and deploying it on a real robotic arm.

<b>Repetitive Control of XY Precision Servo Motion Table</b> Supervised by Prof. Zhen Zhang	Sept 2025 - Present <i>Tsinghua University</i>
------------------------------------------------------------------------------------------------	---------------------------------------------------

- Implemented and analyzed closed-loop control for a 2-DOF precision motion system.
- Performed frequency-response experiments and system identification; developed parametric plant models for controller design.
- Designed and tuned multi-loop controllers (current loop, encoder feedback, PID position control) to achieve stable trajectory tracking.
- *Ongoing:* developing repetitive control to improve tracking accuracy for periodic trajectories, and deploying the controller on FPGA for real-time, standalone operation beyond dSPACE.

<b>Intelligent visual robot's high-definition and highly efficient visual encoder</b> University student entrepreneurship project	Dec 2025 - Present <i>Tsinghua University</i>
--------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------

- Contributed to the design of a Vision Transformer with progressive layer-wise token downsampling for real-time inference on high-resolution images.
- Assisted in reproducing and deploying a Diffusion Policy–based UMI on a real robotic arm for stable multimodal data collection.
- *Ongoing:* Extending the system to vision–tactile perception with a slow–fast hierarchical policy inspired by Reactive Diffusion Policy (RDP), separating high-level visual planning from fast tactile feedback.

<b>A Fuzzy Voice Command Mechanical Arm Interaction System based on LLM</b> Course project, supervised by Dr. Jiuming Guo and Prof. Chuxiong Hu	Dec 2025 <i>Tsinghua University</i>
----------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------

- Designed a remote operating system for robotic arms for elderly people living alone.

- Developed a low-level control module for a robotic arm with native Simulink support, which implements point-to-point trajectory planning, singularity avoidance, state monitoring, and LED light display status. The top-level Python program controls it using the TCP/IP protocol.
- Used a LLM to interpret ambiguous voice commands and executes them through the robotic arm, while also providing friendly voice feedback generated by LLM.

### A Line Following Obstacle Avoidance Vehicle with Ackermann Mechanism based on STM32 July 2025

Course project, supervised by Prof. Jinchun Hu and Prof. Wensheng Yin *Tsinghua University*

- Designed and built an Ackermann-steered mobile robot, modeling steering kinematics and implementing coordinated drive and steering control.
- Developed a hierarchical control architecture with STM32F4 handling low-level motor, servo, and gripper control, and OpenMV serving as a high-level perception and planning unit.
- Implemented vision-based line following and obstacle avoidance using camera sensing combined with IMU feedback for robust navigation.
- Integrated perception, motion control, and manipulation to complete autonomous object transport under real-time constraints.

## INTERNSHIP

---

### TSINGHUA TONGCHUANG ROBOT CO.,LTD

July 2024 , *Tianjin China*

- Developed a MATLAB-based UI tool to assist precision board alignment during fine-tuning processes.
- Modeled the board as a rigid body and computed required adjustment directions and distances from multi-point ( $4 \times XYZ$ ) position measurements.
- Implemented geometric error constraint checking to ensure adjustments met specified tolerance requirements.
- Supported engineering workflows by translating spatial calculations into operator-friendly guidance.

## HONORS AND AWARDS

---

- Best Presentation Award for Advanced Experiments in System Dynamics and Control Course Jan 2026
- Outstanding Sports Scholarship of Tsinghua University Dec 2024 and Dec 2025,respectively
- Outstanding Scholarship for Social Work of Tsinghua University Dec 2024 and Dec 2025,respectively

## SKILLS

---

<b>Programming Language</b>	Python,C,C++
<b>Platforms</b>	Linux(Ubuntu), Windows
<b>Mechanical Design</b>	AutoCAD, Solidworks, Fusion360
<b>Embedded Development</b>	Singlechip(STM32,Raspberry Pi,Arduino),FPGA(Verilog)
<b>Robotics</b>	Control , Kinematics, System Identification, Trajectory Tracking
<b>Control System Design</b>	Matlab,Simulink