Lin Xinxiang

13697718767 | leslie.linxinxiang@outlook.com
https://leslielinxinxiang.github.io/
Male

Tech stack

C++, Python, Linux (RT-Preempt), MoveIt, URDF/MJCF, EtherCAT, MuJoCo, ROS, ROS2, OpenCV, SAM, Prompt

Engineering, Solidworks, CREO, MATLAB

Main research experience

VLM-LGP: Vision-Language Geometric Programming for Long-Horizon Robotic Assembly   Aug 2025 - Present

- Algorithm innovation: Different from traditional TAMP, LGP framework is adopted to unify task and action geometry, and a closed-loop framework of "perception-reasoning-execution-verification" is proposed. VLM is used as "brain" and task pruner (Rule Pruner) **to reduce the logical search space of long sequence assembly tasks by 90%**.
- Engineering reconstruction: in-depth reconstruction of the underlying C ++ geometric solver (KOMO), optimization of motion constraints to meet the requirements of real machine experiments, real machine verification: **90% + complex assembly success rate** has been achieved in real environment,
- Results: the paper has been submitted to **IEEE RA-L** (Under Review).

End-to-end long-sequential autonomous robot operational decisions   Dec 2025 - Present

School-enterprise cooperation project with Linkerbot

- Based on perceptual input such as VLM and CV, autonomously complete multi-step operation tasks in an unstructured environment
- adaptive grasping strategy for dexterous hand: Grasp primitive based on geometric features of objects is developed for dexterous hand O6. By calculating the inclined pose of the target object, the **3-finger/5-finger mode dynamic switching** and **approach pose (Approach Pose) optimization** are realized, which significantly improves the grasping stability of complex bodies in unstructured environment.
- Multi-Modal Spatial Grounding (Spatial Grounding): An end-to-end closed-loop reasoning system based on VLM, which enables the **(Zero-shot) decision-making** capability of directly mapping high-level logic into physical space coordinates.
- **Full stack electromechanical integration and calibration:** The traditional Eye-to-Hand hand-eye calibration and kinematics calculation were completed on the RealSense D435-JAKA Zu3 with Linkerhand O6 platform. MoveIt was used to optimize the trajectory of the manipulator.
- Perception-execution closed-loop error correction: a state verification mechanism based on traditional CV is designed, and an autonomous fault detection and retry mechanism (Error Recovery) is implemented to ensure that the system can automatically trigger secondary replanning in the event of capture failure or environmental disturbance, and achieve robust execution of multi-step long timing tasks.

Mechatronic Design & Locomotion for Bipedal Humanoid   Oct 2026 - Present

Collaboration with Leaderdrive

- Responsible for the mechatronic design of the robot's structural parts, algorithm deployment and real machine testing
- Mechatronics integration: Responsible for the design of the humanoid robot joint module based on the high torque harmonic reducer and the integration of the whole machine, optimizing the stiffness of the transmission chain and the installation position of the sensor.
- Hardware-in-the-loop (HIL) test: leads the hardware calibration and system integration test of the biped robot, and builds a high-frequency (1kHz) control feedback link based on EtherCAT communication.
- **Control algorithm deployment and optimization**: assist in the deployment of Locomotion algorithm, identify

and solve the problem of control gain divergence due to mechanical resonance through real machine data analysis, and use physical noise reduction and underlying filtering strategies to ensure the stability of the walking algorithm on the real machine.

Major Project Experience

MOVA 1000&600 Mowing Robot   Jul 2024 - Jul 2025
Mechanical and structural engineers   Shenzhen

Project background:

- A borderless mowing robot

Project Responsibilities:

- Leading actuator (cutter head module) precision structure design, dynamic balance optimization
- Prototype, trial production leading: responsible for prototype sample proofing and testing, as well as trial, trial production and mass production follow-up
- Deal with improving proofing and mass production of structural technical problems

Key contribution:

- **To solve the complex outdoor environment of the cutterhead system waterproof sealing and vibration compensation problem**

Project results:

- **The global sales volume of series is 25W,** far ahead in the same category.

Constant force lifting structure   Nov 2023 - Mar 2024
Mechanical Engineer Leifen   Shenzhen

Project background:

1. In the company's current research and development projects, including desk lamps and cosmetic mirrors, a number of products are facing a height adjustment experience of poor common problems, mainly for the need for both hands to operate, adjust the jam, the project through the cam and spring combination structure, through the elastic potential energy and gravity potential energy conversion principle, to enhance the user to adjust the product height of the user experience

Project Responsibilities:

1. Competition dismantling and analysis
2. Prototype forward design (spring selection, cam function calculation, etc.)
3. Technical landing (guide the project team engineers for specific needs and project adaptation modification design)

Project results:

1. As the company's several projects of common problems and needs, the technology has been decentralized to the company's several lifting needs in the research products.
2. The design has applied for a utility model patent

Blade mowing robot   Feb 2022 - Jul 2023
Mechanical and structural engineers Jung-ho

Project background:

1. Based on the company's development of electricity ecological vision, the development of a for outdoor courtyard lawn cleaning mowing robot

Responsible part:

1. Sub-project lawn cleaner design, mold opening and **mass production follow-up maintenance** (lifting module, roller brush module)
2. Lawn mower cutter head lifting module optimization, mass production problem solving

2. Lawn mower cutter head lifting module optimization, mass production problem solving

Project Responsibilities:

1. Sub-project lawn cleaner roller brush module and lifting module design, proofing, mass production follow-up (structural hand design, plastic parts disassembly, mold opening, motor and slide rail selection)
2. Sub-project lawn cleaner overflow detection scheme design (sensor selection, demand determination, coordination of software and hardware to meet demand)
3. Cutter head lifting module mass production process optimization, adjust the gearbox turbine worm material, improve lifting module life

Project results:

1. 2023 US CES exhibition INNOVATION AWARD
2. Listing month sales achievement rate of 109 (4 million USD +)
3. Reducer working life increased by 40%
4. Design of grass clippings leaf collection module by the user praise and peer follow-up
5. **Five utility model patents**

Work Experience

Dreame technology Co., ltd   Jul 2024 - Jul 2025

Structural Engineer   Shenzhen

Founded in 2017,
    Chase Technology is a global high-end consumer electronics and intelligent manufacturing company with high-speed digital motors, intelligent algorithms and motion control technology as its core. At present, the company has nearly 20000 employees, and GMV is estimated to exceed 20 billion in 25 years.

Laifen Technology Co., ltd   Sep 2023 - Jul 2024

Mechanical and structural engineers   Shenzhen

Founded in 2021,
    Leifen Technology Co., Ltd. is headquartered in Shenzhen, focusing on the design, development and sales of household appliances. The main products include high-speed hair dryers, electric toothbrushes and other personal care appliances. The company takes "technology inclusive" as its proposition and is committed to providing consumers with high-quality and affordable products. In 2023, Leifen's global sales exceeded $0.5 billion and its service users exceeded 3 million.

Ecoflow Innovation Technology Co., Ltd   Feb 2022 - Jul 2023

Mechanical and structural engineers   Shenzhen

Zhenghao Innovation, a unicorn EcoFlow in the
    energy storage industry, was established in 2017 and currently has more than 2000 employees. The company is headquartered in Shenzhen and has branches in Europe, Japan, and Silicon Valley in the United States. The company's main business is energy storage and electricity ecology (e. g. smart lawn mowers, outdoor air conditioners). Zhenghao Innovation's global sales in 2022 are nearly 1 billion US dollars (nearly 7 billion yuan). At present, Zhenghao covers more than 100 countries/regions in the world and serves more than 2.5 million users.

EDUCATION

University of Macau   Aug 2025 - Aug 2027

Robots and autonomous systems Master   Macau

Zhuhai College Of Jilin University   Sep 2018 - Jul 2022

Mechanical design and manufacturing and its automation Bachelor   Zhuhai

- The 20th ROBOCON National University Student Robot Contest Guangdong Province Third Prize Contest Theme: Pots and Pots

Project Responsibilities:

- Overall design of launching mechanism
- Guiding selection of motor and steering gear
- Be responsible for dismantling the requirements, coordinating the members of the group, reasonably allocating tasks, and being responsible for the achievement of the tasks of the group.
- Responsible for inter-group communication, demand alignment, as the group and item management, electronic control and other groups of the external window, responsible for cross-group information pull and coordination

Project results: National third prize