Lin Xinxiang

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

Tech stack

Languages & Frameworks: C++, Python, Linux (RT-Preempt), ROS/ROS2, PyTorch
Robotics & Control: MoveIt, URDF/MJCF, EtherCAT, MuJoCo, OpenCV, SAM
Engineering Tools: SolidWorks, CREO, MATLAB, Prompt Engineering

Main research experience

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

- Algorithmic Innovation: Proposed a "Perception-Reasoning-Execution-Verification" closed-loop framework unifying task and action geometry. Utilized VLMs as semantic "Rule Pruners" to reduce the logical search space for long-horizon assembly by 90%.
Engineering Refactoring: Refactored the underlying C++ KOMO geometric solver, optimizing motion constraints to bridge the Sim-to-Real gap for complex physical interactions.
Real-world Validation: Achieved a 90%+ success rate in complex multi-step assembly tasks in unstructured environments.
Outcome: Paper submitted to IEEE Robotics and Automation Letters (RA-L; Under Review).

End-to-End Reasoning for Long-Horizon Autonomous Manipulation   Dec 2025 - Present

Joint Industry-University Project with Linkerbot

- System Architecture: Developed a vision-centric closed-loop agent to **autonomously execute multi-step manipulation tasks** in unstructured environments.
- **Adaptive Grasping Strategy:** Engineered geometric-based grasp primitives for the Lingxin O6 Dexterous Hand. Implemented dynamic 3-finger/5-finger mode switching and approach pose optimization, significantly enhancing grasp stability.
- Spatial Grounding: Achieved zero-shot multi-modal spatial grounding, enabling the VLM to directly map high-level semantic logic into physical space coordinates.
- Mechatronic Integration: Led full-stack integration and Eye-to-Hand calibration on a RealSense D435 and 6-DOF JAKA Zu3 platform, utilizing MoveIt for robust trajectory planning.
- Error Recovery: Designed a **CV-based state verification mechanism** with autonomous fault detection, triggering secondary replanning upon grasp failures to ensure task completion.

Mechatronic Design & Locomotion for Bipedal Humanoid   Oct 2026 - Present

Collaboration with Leaderdrive

- Mechatronic Integration: Led the mechanical design and full-system integration of humanoid joint modules utilizing high-torque harmonic drives, optimizing transmission chain stiffness and sensor alignment.
- HIL Testing: Conducted hardware-in-the-loop (HIL) testing and **built a 1kHz high-frequency control feedback loop** via EtherCAT communication.
- Locomotion Deployment: Deployed bipedal locomotion algorithms and **resolved control gain divergence** by mitigating Mechanical Resonance through physical structural tuning and low-level notch filtering.

Major Project Experience

MOVA 1000&600 Mowing Robot   Jul 2024 - Jul 2025

Mechanical and structural engineer   Shenzhen

- Actuator Design: Led the precision mechanical design and dynamic balance optimization of the blade actuator module.
- Product Lifecycle: Managed the full hardware lifecycle from prototyping and DFM (Design for Manufacturing)

to mass production tracking.

- Key Contribution: **Resolved IPX-rated waterproofing and vibration compensation challenges** for harsh outdoor environments.
Impact: **Contributed to a global series sales volume of 250,000+ units**, leading the market category.

Constant Force Lifting Mechanism
Nov 2023 - Mar 2024

Mechanical Engineer Leifen
Shenzhen

- Core Mechanism: Engineered a gravity-compensation structure using a scotch yoke and cam mechanism, converting non-linear elastic potential energy to provide a zero-effort, hovering-like height adjustment experience.
- Forward Design: Conducted competitive benchmarking and led the mathematical calculation of cam profiles and coil spring selection.
- Impact: **Successfully standardized and deployed this generalized mechanism across multiple R&D product lines.**

BLADE Robotic Lawn Mower
Feb 2022 - Jul 2023

Mechanical and Structural engineer Jung-ho

- Module Development: Led the structural design, tooling, and mass-production scaling of the mowing deck and leaf collection module.
Cross-functional Integration: Designed the grass overflow detection scheme, driving sensor selection and software/hardware integration.
- Reliability Optimization: Optimized the gearbox turbine worm material, extending the reducer's service life by 40%.
Impact & Patents: Product won the 2023 CES Innovation Award and achieved 109% of its $4M+ sales target in the launch month.

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

- Mechanical Design: Led the overall structural design of the projectile launching mechanism.
- Actuation & Sizing: Guided the calculation and selection of driving motors and steering servos.
- Project Management: Deconstructed system requirements, coordinated a 10-member cross-functional team, and allocated engineering tasks effectively.
- System Integration: Acted as the technical liaison between mechanical, electrical, and control sub-teams, ensuring seamless hardware-software alignment.
- Result: Won the National 3rd Prize.