

ASTRAL Dynamics

DRIVING THE ROBOTIC REVOLUTION WITH POWER LEAP



01

企业简介
Company Intro

Astrall Dynamics is an innovative enterprise dedicated to the independent R&D of robots and its core components. We have built a comprehensive intelligent motion control ecosystem and is committed to providing excellent power and precise control of robots and core component products for enterprise and consumer markets. Through technological innovation and product development, promote the development of technology in the robotics industry, and improve the performance and reliability of robots.

01

Innovation

The core team is composed of personnel from the former core departments of DJI, with experience in the R&D process of algorithm, control, image transmission, mechanical, and system engineering.

02

R&D

Key robot components and core components such as joint motor modules, wireless image transmission links, drivers, encoders, etc.

03

Application

It can be applied to high-risk and complex scenarios such as inspection, security, and outdoor rescue, and is also penetrating into diversified industrial and consumer fields such as logistics distribution and education , with huge market potential.

02

产品介绍

Product Introduction

Intelligent Quadruped Robotic Dogs

Max Payload **200kg**
Battery Life > 8h



Axial Flux Motors

Max torque **580 N·m**



Image Transmission System

Distance > 30km



Performance Parameters of Astrall' s Robotic Dogs

Parameters	Hypertron T01	Hypertron SW01	Hypertron SF01
Standing size	1100mm*610mm*745mm	930.5mm*524 mm*656mm	930.5mm*524mm*590mm
Weight (With Battery)	85kg	47kg	39kg
Speed	7m/s *	8 m/s*	5 m/s *
Max Standing Payload	200kg	120kg	120kg
Max working Payload	80kg	50kg	40kg
Climbing Payload	80kg	40kg	30kg
Battery Life	> 8h	> 6h	> 6h
Continuous Stair-Climbing Capability	25cm	25cm	25cm
Climbing Capability	90cm*	100cm*	50cm*
Slope-Walking Capability	~45°	~45°	~45°
IP Class	IP67	IP67	IP67
Operating Tempeture	-20°C~55°C	-20°C~55°C	-20°C~55°C



* Data is obtained under experimental conditions. For safety reasons, it is not enabled by default at the factory.

Firstly Applied 192-Channel LiDAR — Centimeter-Level Precision

ASTRALL Dynamics



World's First Hemispherical Digital LiDAR

- Equipped with **192-channel** high-precision LiDAR, which is the first application of ultra-high scanning resolution and point cloud density technology on robotic dogs.
- FOV Ultra-wide hemispherical FOV with **360°** horizontal coverage and **90°** vertical coverage.
- Significantly improves data acquisition efficiency and measurement accuracy.



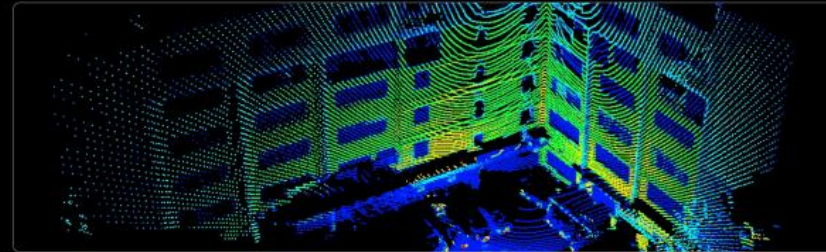
Long Range, High Precision, High Perception

- Covers a diameter range of **120m**, enhancing the efficiency of obstacle avoidance, mapping, and positioning.
- Point cloud rate of **~1,720,000pts/s**, **2** times of similar products.
- Ranging accuracy: **±1cm**, representing a **50%** reduction in error.

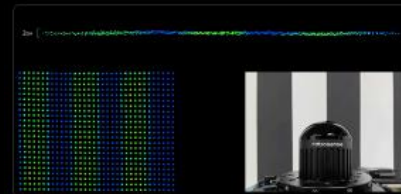
The operation and control precision reaches the "**Centimeter-level**", comprehensively enhancing perception and operational accuracy.



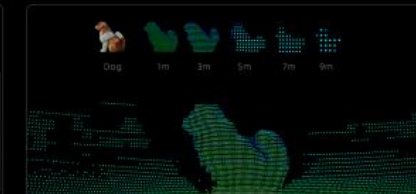
Hemispherical Ultra-Wide Angle FOV



Ranging accuracy up to $\pm 1\text{cm}$



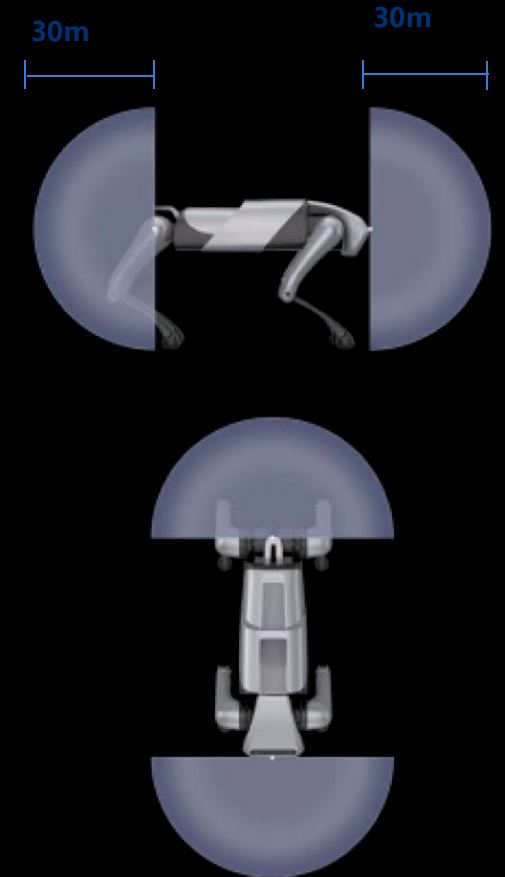
High-definition detection of small animals

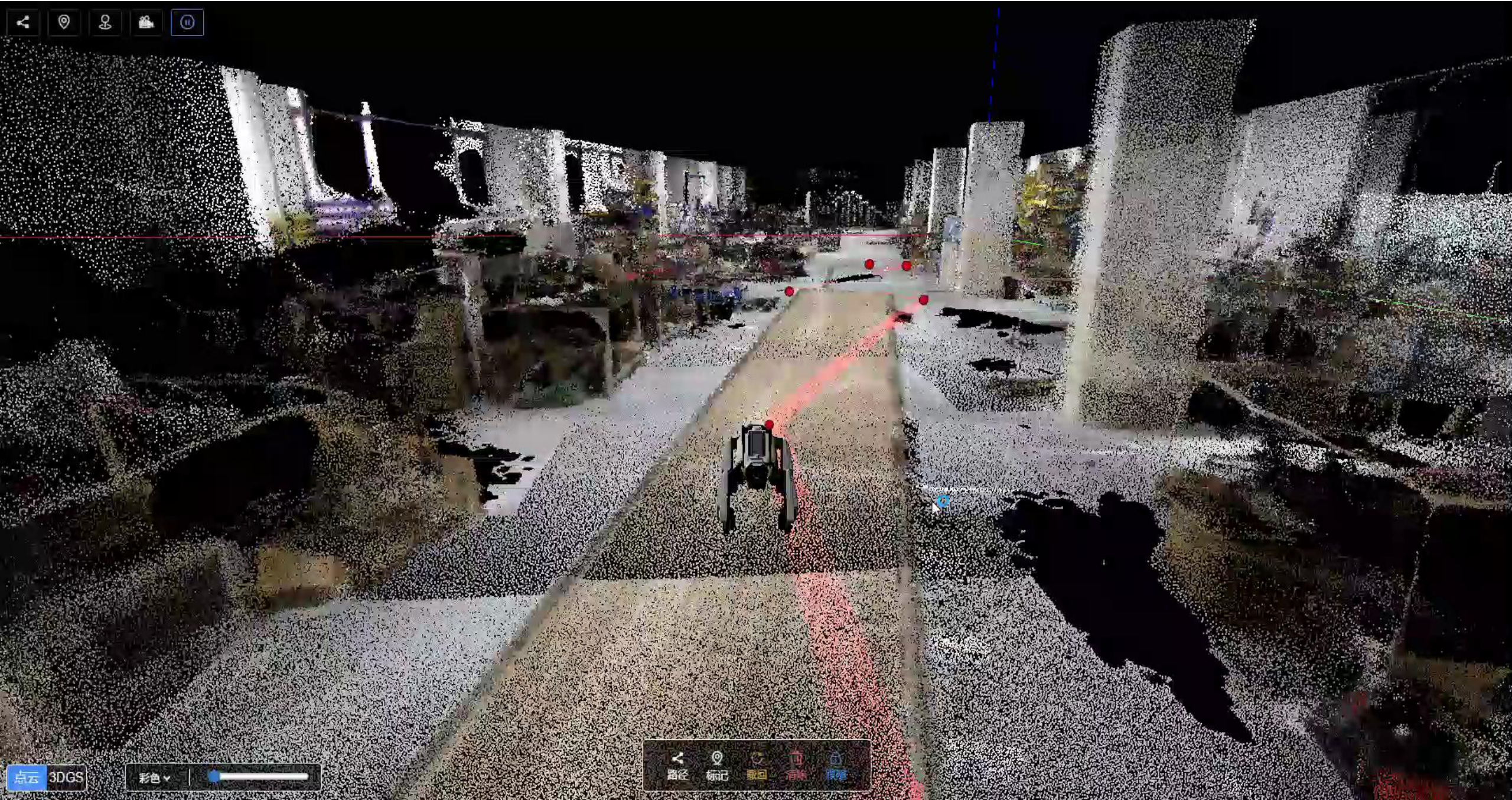


3D SLAM



High-Definition Point Cloud





点云 3DGS



03

行业解决方案
Industry Solutions

Application Scenarios :



Firefighting



Power & Utility



Mine Industry & Rails



Security & Safety



Industrial Zones



Buildings & Utility Tunnels



Petrochemical Industry



Hydraulic Engineering

Functions:

Operation & Maintenance Inspection; Monitoring & Patrolling; Surveying & Mapping; Transportation, etc..



Power & Utility Inspection Solutions

⚠ Challenges of Traditional Power & Utilities Inspection



Environmental Adaptability

Difficult for manual inspection to proceed in harsh weather (rainstorm, snowstorm, extreme heat/humidity) and strong electromagnetic environments.



Data Collection and Analysis

Manual data recording is slow and requires post-processing, leading to delayed uploads and alerts.



High-Intensity Repetitive Work

Manual execution is highly repetitive, leading to high labor costs and fatigue.

Improving inspection efficiency is a critical challenge.



Data Accuracy

The accuracy and consistency of inspection data are highly dependent on the inspector's physical and mental state.

Errors and omissions are prone to occur.

✓ Advantages of Quadruped Robots



Personnel Safety

- Replaces humans in high-risk areas, avoiding direct exposure to high-voltage and high-altitude environments.
- Enables remote operation, allowing operators to monitor from a safe zone.

Inspection Range

- Possesses climbing, obstacle-surmounting, and crawling capabilities, covering areas inaccessible to vehicles and drones.
- Supports 24/7 uninterrupted inspection, increasing inspection frequency and scope.

Environmental Adaptability

- The body is designed to be waterproof, dustproof, and resistant to electromagnetic interference, enabling stable operation in harsh weather such as rainstorms and high temperatures.
- Unaffected by light conditions; inspections can be completed via external devices at night.

Data Transmission and Analysis

- Equipped with high-definition cameras, infrared thermal imagers, gas sensors, etc., enabling real-time collection of equipment temperature, external appearance, gas concentration, and other data.
- Supports 4G real-time data transmission and integrates AI algorithms for automatic fault identification and early warning.

Selecting Functional Modules Based on Requirements



Dual-Light PTZ

Visible light ensures clear imaging day and night; thermal imaging is unaffected by fog, rain, and other adverse weather conditions, enabling 24/7 uninterrupted operation. Quickly captures temperature differences of equipment and accurately locates heat sources.



UV PTZ

Detects electrical discharge and partial discharge characteristics of power equipment, enabling rapid identification of electrical heads, switches, insulators, and other equipment conditions. Indirectly assesses the insulation status of power equipment.



Acoustic Camera

Features sound source acquisition, image visualization, and sound intensity visualization functions, enabling visualized diagnosis of equipment faults. Accurately identifies fault types such as electrical discharge, mechanical friction, vibration, compressed gas leakage, and bearing wear.



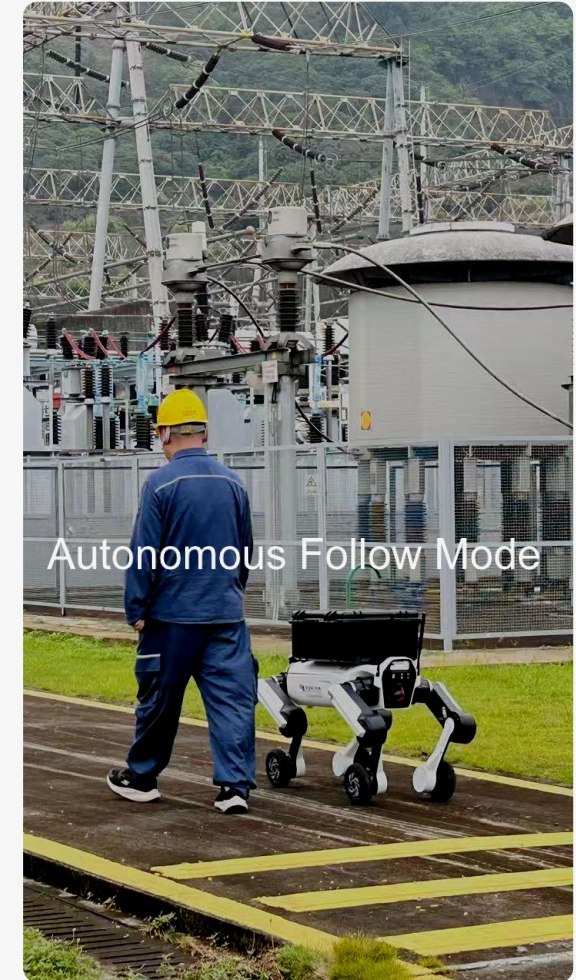
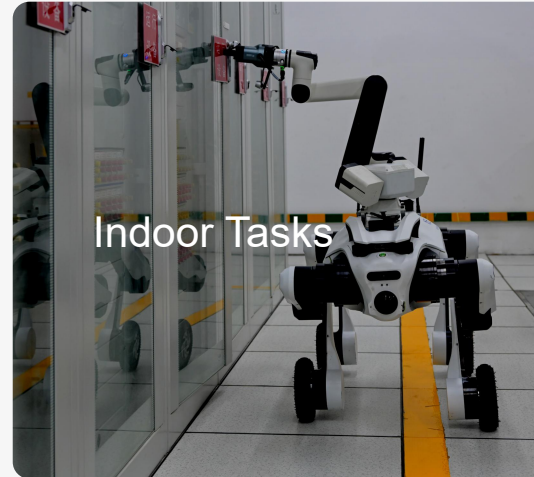
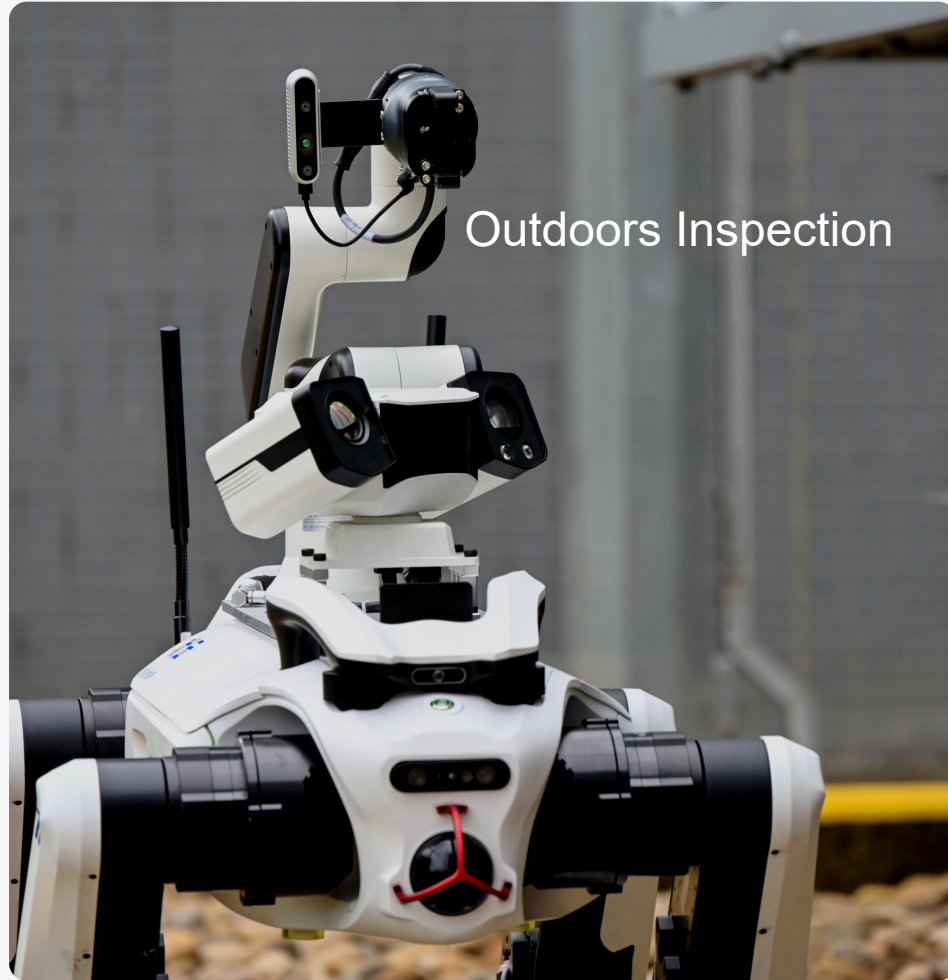
Mechanical Arm

Replaces manual work for high-precision tasks, solving problems in hard-to-reach and high-risk inspection/auxiliary scenarios. Improves the safety and efficiency of operations.



High-Precision Navigation & Positioning Module

Integrates RTK high-precision GNSS receiving and inertial navigation IMU technologies, outputting centimeter-level latitude and longitude information for high-precision navigation and positioning.





Emergency Firefighting Solutions

! Difficulties and Challenges in Emergency Firefighting Scenarios



Fire environments are often characterized by dense smoke, high temperatures, and the pervasive presence of toxic gases.



Buildings collapse after disasters such as earthquakes, resulting in narrow search-and-rescue spaces and unstable structures



Heavy detection equipment and rescue tools require great physical strength from rescuers

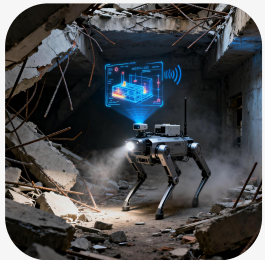


In scenarios of power outage, communication disruption & road blockage - need to obtain real-time on-site information for rescue

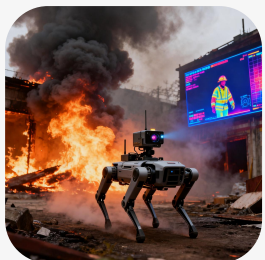
Quadruped robots can assist in completing inspection & operational tasks



Replace firefighters in entering fire scenes filled with dense smoke, high temperatures and toxic gases.



Enter structurally unstable buildings or areas to inspect various conditions.



With thermal imagers & life detectors, can quickly locate trapped personnel for rescue planning.



Dual-light gimbal

- Infrared mode to detect fire locations & spread trends /Visible light mode to identify building structures & traces of trapped individuals.
- Transmits real-time on-site video.



Toxic and Hazardous Gas Detector

- Detects on-site gas components, flammable gases(methane & hydrogen), toxic gases (carbon monoxide & hydrogen sulfide), ensuring the life safety of search and rescue personnel and preventing secondary injuries.



Temperature and Humidity Detector

- Monitors extreme environments such as high & low temperatures & high humidity in real time, preventing heatstroke, frostbite, and equipment failure due to moisture. It provides data support for determining rescue priorities and formulating rescue plans.

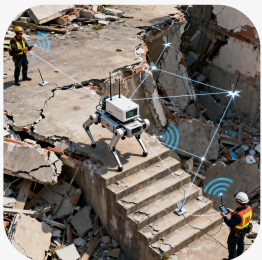
Quadruped robots can assist in completing inspection & operational tasks



Can follow rescue teams to transport tools, ropes, hoses, gas cylinders and other supplies, reducing the workload.



With small fire extinguishing devices, can conduct initial fire suppression at fire spots.



With ad hoc network devices, can rapidly establish communication links & provide a continuous communication network.



Pulse Water Cannon

- Replaces personnel in handling high-risk fire scenarios, (fires involving chemical explosions, oil tank fires, & toxic gas leaks), preventing direct exposure to high temperatures, toxic substances, and explosion risks.



Payload Box

- Can effectively carry fire & rescue equipment (gas cylinders & hoses), to perform search & rescue / firefighting operations, traverse complex terrain or climb stairs, and provide backup tools at any time.



Audio Pickup & Loudspeaker Module

- Enables voice communication, transmits real-time instructions, guides the evacuation of trapped people, issues warnings to prevent unauthorized personnel from entering.



Mesh Ad Hoc Network Module

- Paired with high-performance multi-core processor and high-performance wireless SDR video transmission solution, it enables stable and reliable beyond-visual-range data and image transmission.



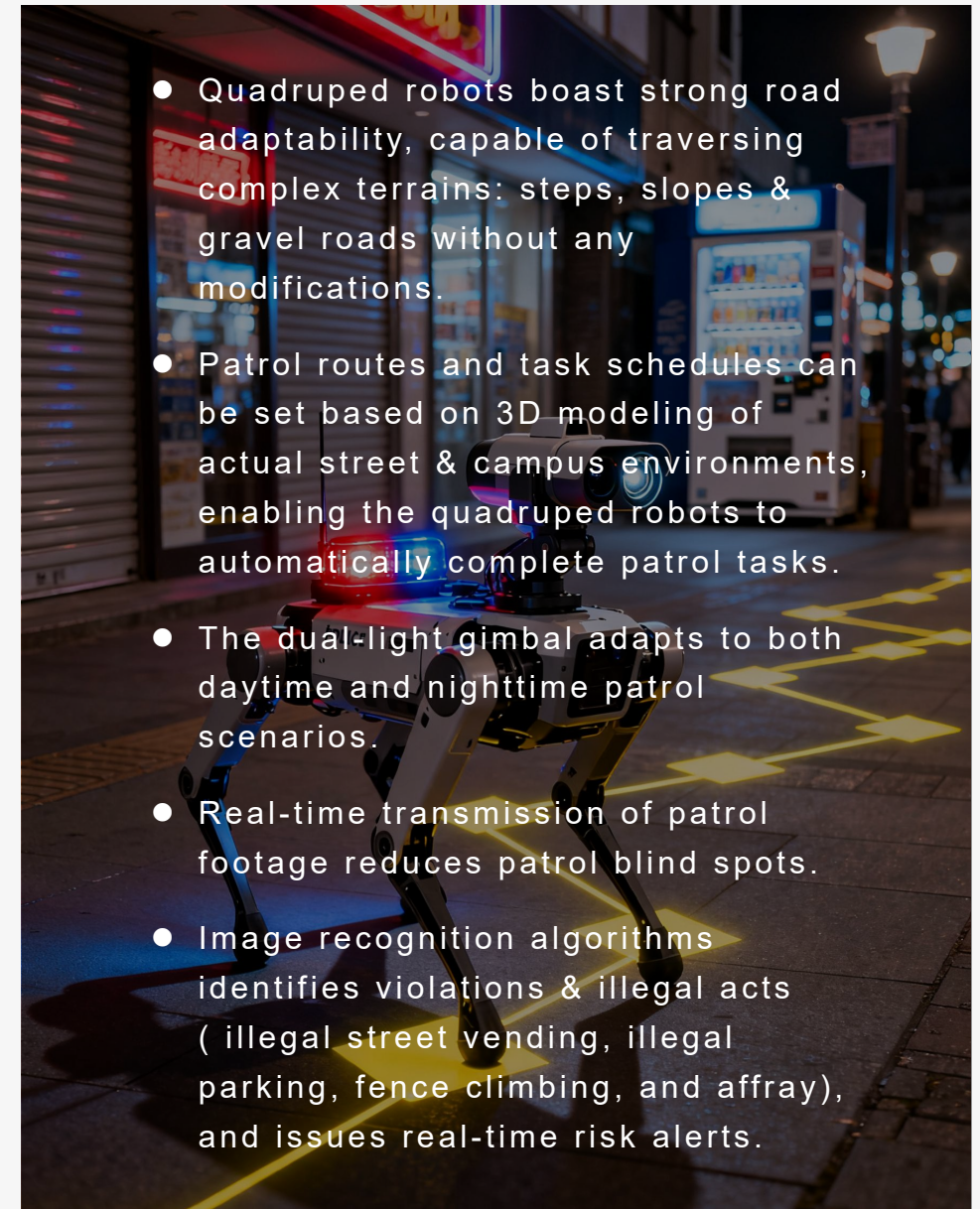
Law Enforcement & Security Solutions

✓ Assisting in public security patrols

Payload modules: dual-light gimbal, strobe light, red-blue warning lights, loudspeaker & audio pickup.



- Major public areas (commercial streets, stations, & school surroundings)
- Large area, high task repetition, & night patrol requirements, traditional police force resources are heavily consumed.

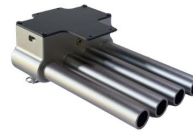


- Quadruped robots boast strong road adaptability, capable of traversing complex terrains: steps, slopes & gravel roads without any modifications.
- Patrol routes and task schedules can be set based on 3D modeling of actual street & campus environments, enabling the quadruped robots to automatically complete patrol tasks.
- The dual-light gimbal adapts to both daytime and nighttime patrol scenarios.
- Real-time transmission of patrol footage reduces patrol blind spots.
- Image recognition algorithms identifies violations & illegal acts (illegal street vending, illegal parking, fence climbing, and affray), and issues real-time risk alerts.

Quadruped robots can provide certain interference and deterrence support



- Scenarios involving sudden violence & emergency police situations, close-range disposal poses a high risk of injury to law enforcement officers.
- Such incidents often occur in complex terrains such as streets, alleys, shopping malls and residential areas, where operations are easily obstructed by obstacles.
- Violent incidents tend to attract significant public attention, & the standardization of law enforcement procedures directly influences the direction of public opinion.



- Replace personnel in high-risk core areas for reconnaissance, persuasion and deterrence, protecting law enforcement officers from violent conflicts
- With a bionic legged design, they traverse obstacles and quickly access sealed, hard-to-reach areas
- Modular payloads enable integrated operation of detection, transmission, persuasion and control for efficient response
- Full-process recording provides objective evidence for law enforcement

Integrated Park Applications Cover Industry-Wide Needs



✓ Intergrated Park Applications

Facility Inspection

Smart systems assign inspection tasks for infrastructure (transformers, valves, external equipment). Robot dogs autonomously plan routes, navigate and avoid obstacles, use zoom cameras and AI to conduct automatic inspections, and send results to the central platform.



Fire Safety Support

Robot dogs perform fire facility checks, fire lane inspections and high-risk area patrols. Equipped with triple-light gimbals and AI, they detect blocked fire lanes, damaged facilities and hazards, ensuring park fire safety.



✓ Intergrated Park Applications

Security Patrol

Robot dogs provide 24/7 unmanned patrols, complementing manual security and reducing human-related risks. They identify unauthorized personnel and vehicles via facial and vehicle recognition. Night patrols, cameras and on-site staff form a full-coverage security system.



Engineering Project Monitoring

Equipped with loudspeakers, dust detectors and optical gimbals, robot dogs assist construction management. AI identifies safety helmet use and verifies worker identities, with voice warnings for violations. Dust monitoring ensures environmental compliance.



ASTRAL

Thanks

for watching

