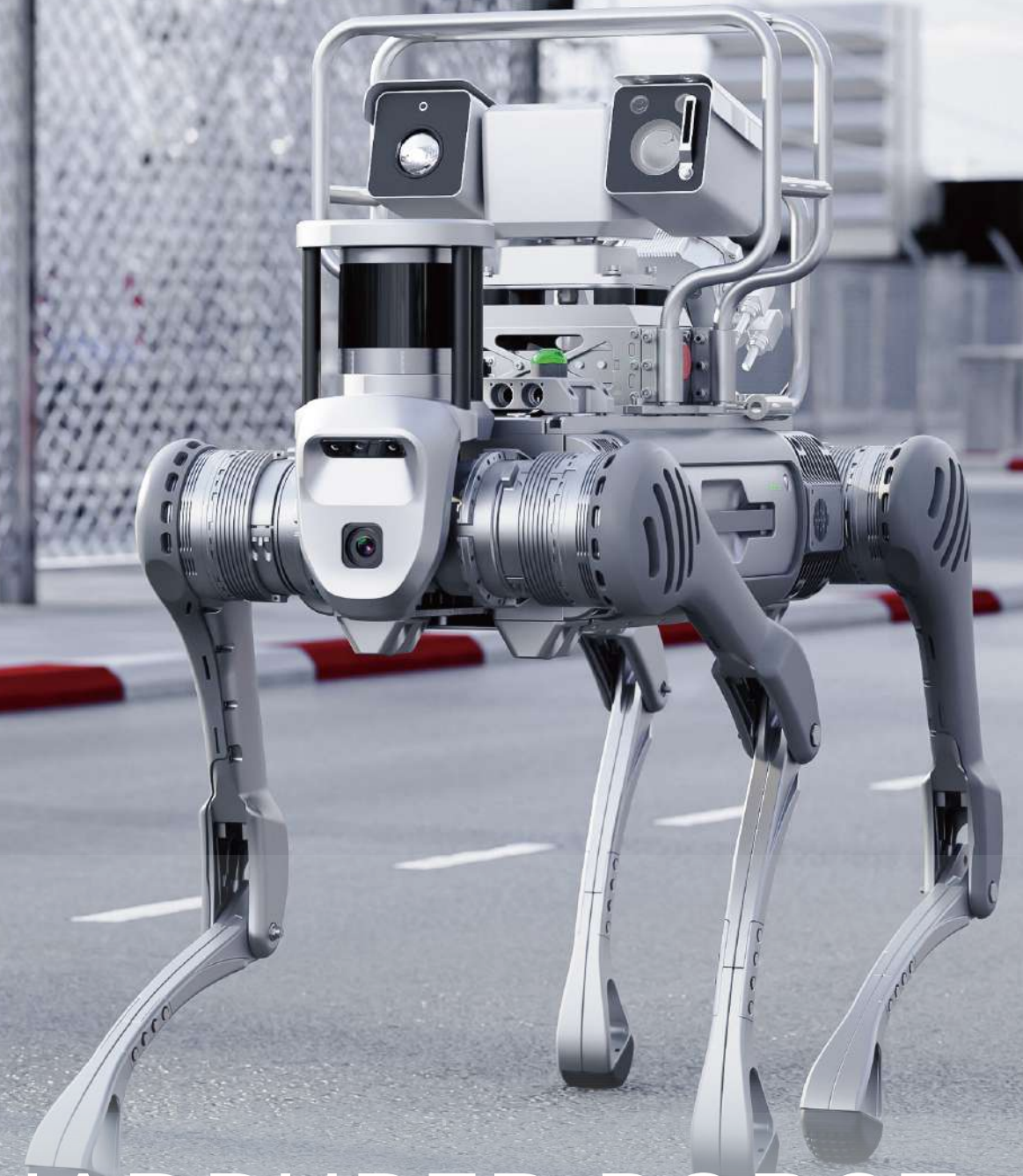


UNITREE



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Please visit Unitree Robotics Website for more related terms and policies, and comply with local laws and regulations.

※ This product is a civilian robot. We kindly request that all users refrain from making any dangerous modifications or using the robot in a hazardous manner.

QUADRUPED ROBOT INTELLIGENT INSPECTION SOLUTION



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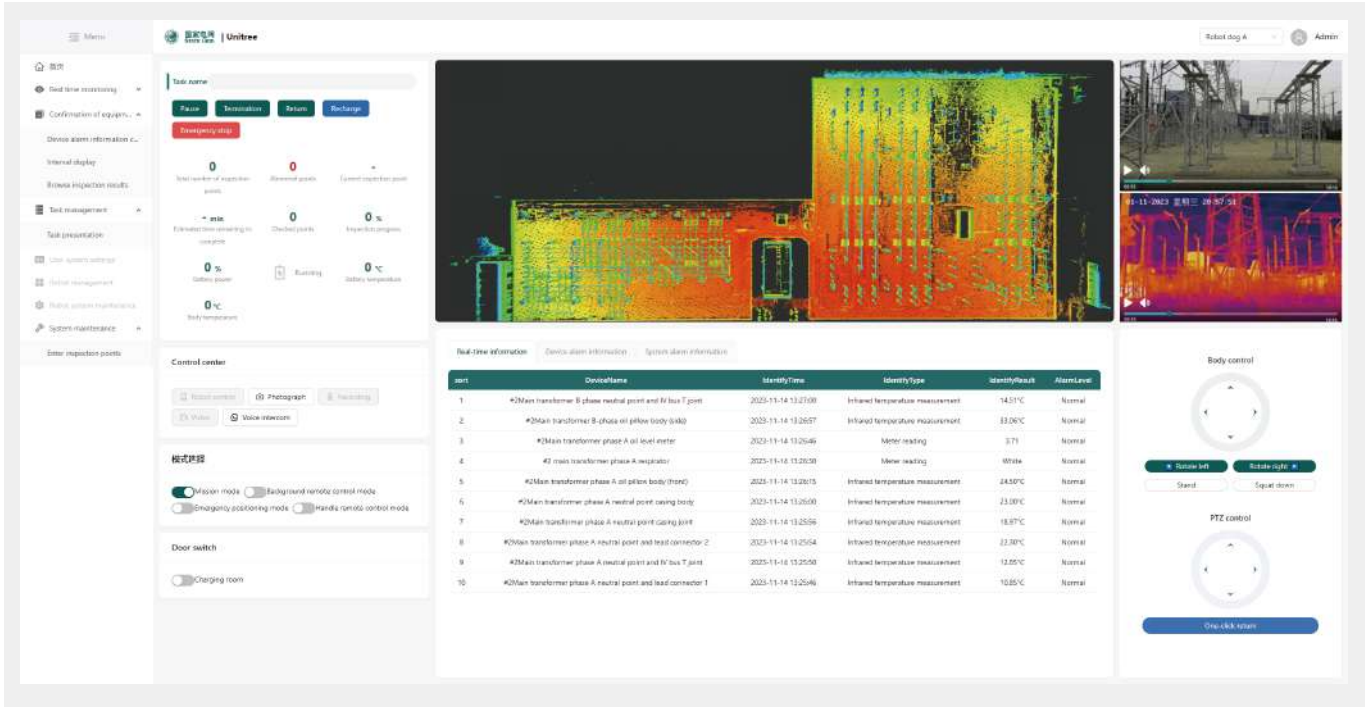
Unitree quadruped robot inspection solution can be flexibly equipped with dual-light PTZ, robotic arms, acoustic imager, gas detection and other intelligent equipment, and integrates multiple technical means such as robotics, image recognition, big data, AI, and digital twins.

In scenarios such as power stations, pipeline corridors, and non-electricity industrial parks and factories, this solution can achieve full coverage, unmanned, digital, and intelligent operation and maintenance, promoting the development of new power systems and other smart industries.

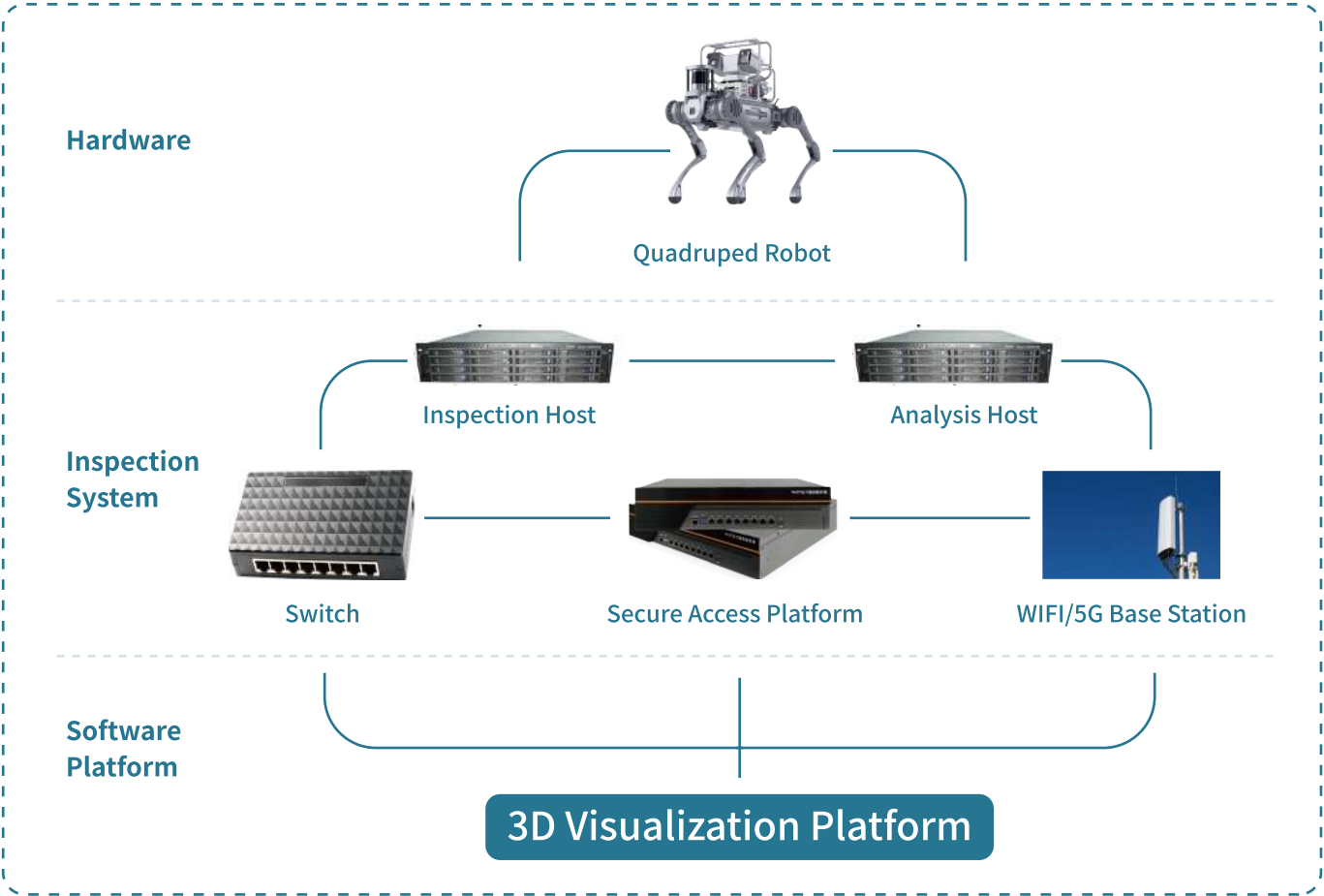


Unitree Intelligent Inspection Management Platform

Unitree intelligent inspection management platform is the core of the entire system. This platform aims at addressing the application requirements of unmanned, digital and intelligent equipment on-site inspection. It processes and analyzes the data collected by the robot in real time. Through methods such as comparison with historical data and fault mode identification, the status of the equipment can be evaluated and given early warning, potential faults and hidden dangers also can be discovered in a timely manner. At the same time, the platform can also uniformly manage and store inspection data to facilitate data tracing and analysis. The platform can be connected to multiple devices in a unified manner. On this platform, users can realize 3D data visualization, automatic inspection, intelligent analysis, intelligent early warning, intelligent linkage, intelligent decision-making, emergency response and other tasks, helping users achieve unmanned management and control of equipment.



Introduction to Quadruped Robot Inspection Solution



Functions

Self Inspection

Multiple inspection contents including comprehensive inspection, routine inspection, project inspection and special inspection can be configured according to different requirements.

AI Intelligent Recognition

Meter readings, status identification, defect identification, precise infrared temperature measurement, partial discharge detection, etc.

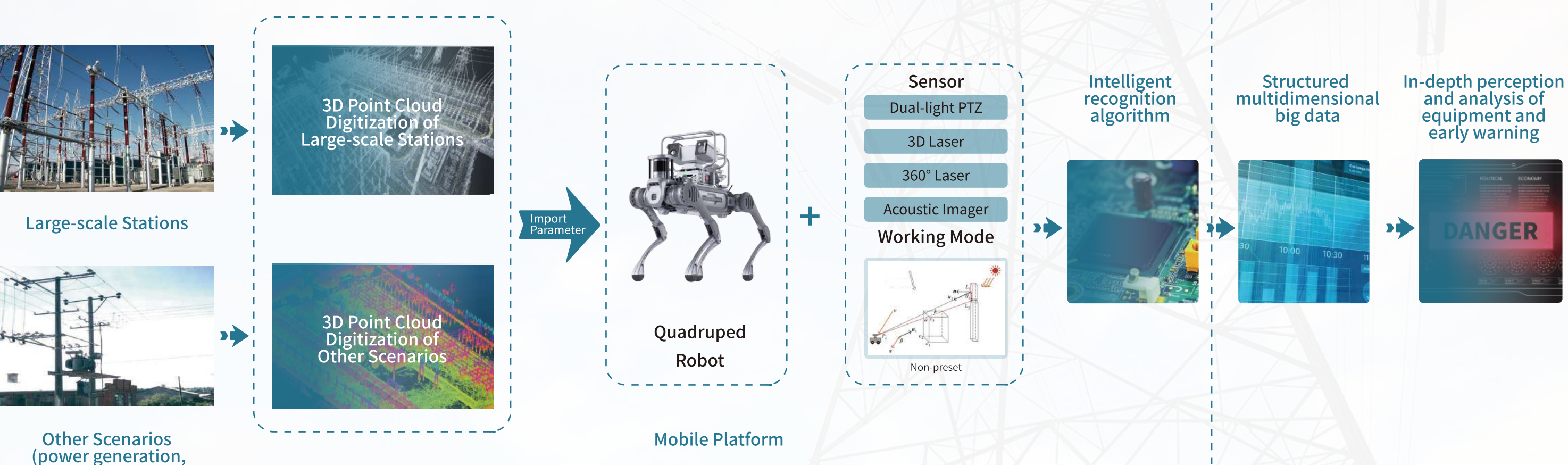
3D Visualization

This function is reflected in 3D inspection, fault diagnosis, equipment maintenance, safety management, 3D interaction, etc., improving station operation efficiency, reducing operation and maintenance costs, and helping users achieve comprehensive perception, intelligent analysis and precise control of the substation.

Data Analysis

Based on inspection data, historical curves, equipment life cycles, and risk assessments all can be conducted.

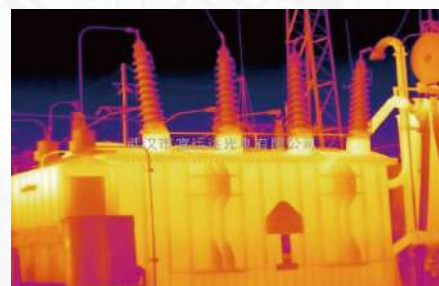
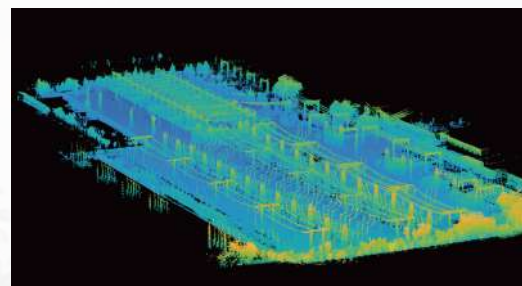
INSPECTION PROCESS



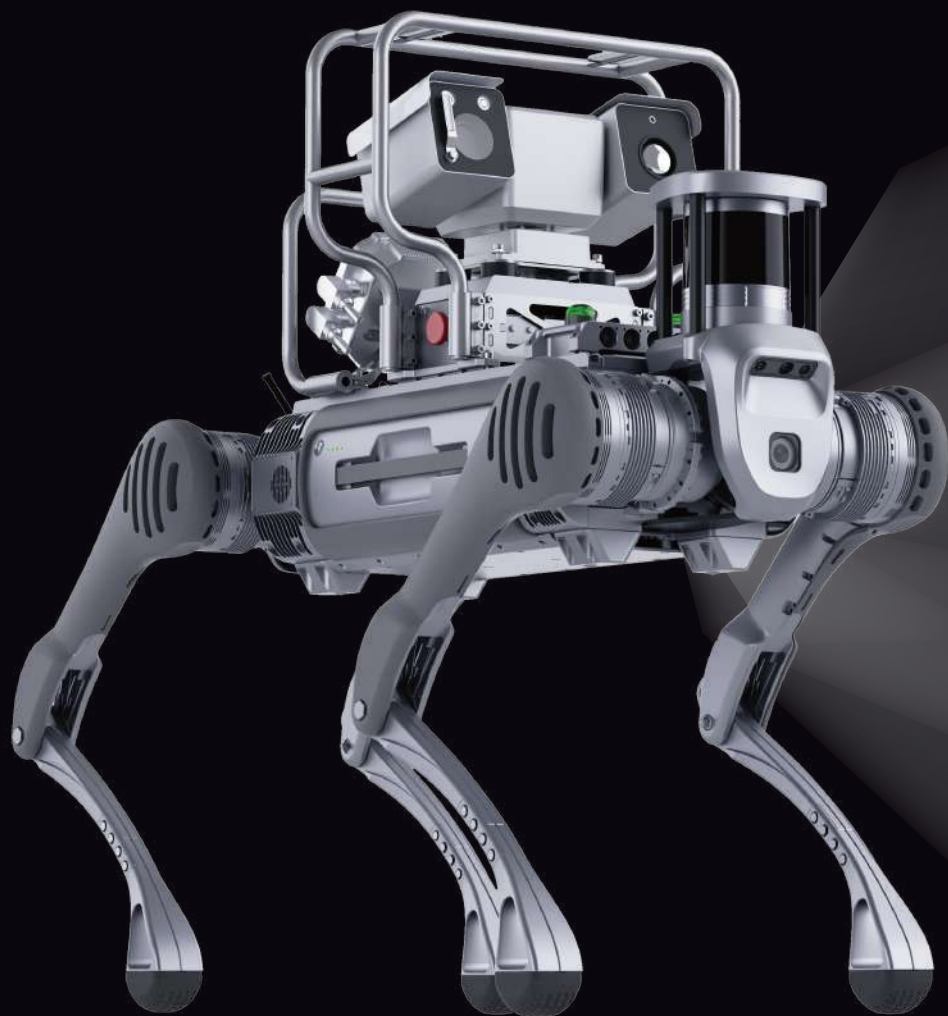
Realize rapid remote deployment, operation and maintenance based on digital three-dimensional environment

New Working Mode:
Inspection Operations + Emergency Operations

Comprehensive Collection +
Intelligent Algorithm Analysis



DIGITAL TWIN PLATFORM

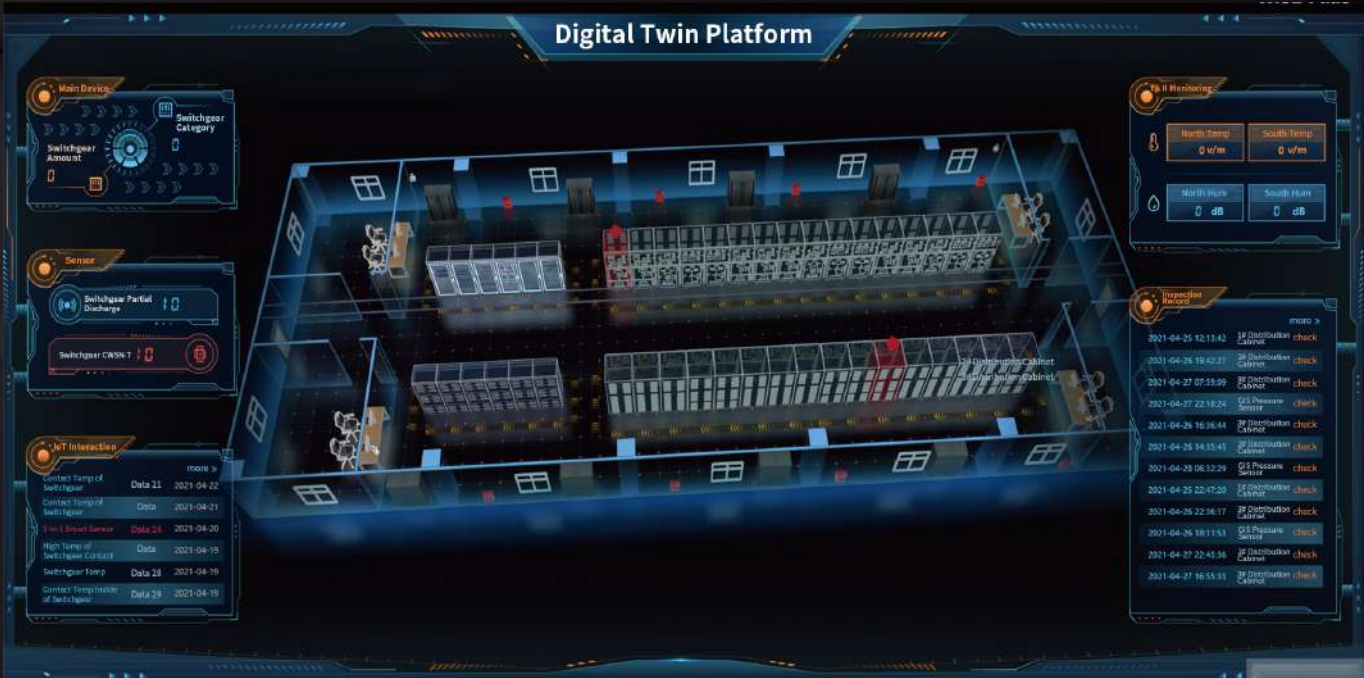


Real-time
Data-driven



Quadruped Robot Inspection

Reproduce the inspection trajectory of the quadruped robot in real time in the digital twin scene to find out whether the inspection route is reasonable and whether there are any omissions.



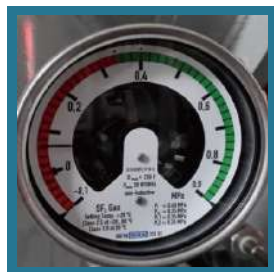
First Person Perspective Inspection

Inspection paths can be manually planned in the digital twin scenario, allowing the screen to present the automatic inspection process from a first-person perspective, allowing users to view equipment status, parameters, and whether there are faults and abnormalities.


Intelligent Inspection System

Intelligent Identification


Based on image recognition technology, the operating status of various instruments and meters can be automatically identified to reduce the work-load of manual inspections on site.




SF₆ Meter




Oil Level




Oil Level




Arrester




Oil Temperature



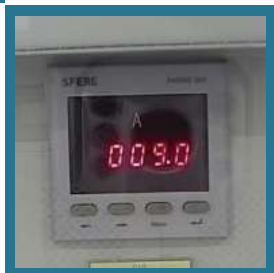
Reactor



Liquid Level

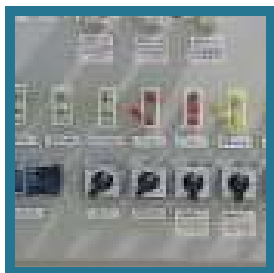


Energy Storage Indication




LED Data


INTELLIGENT IDENTIFICATION



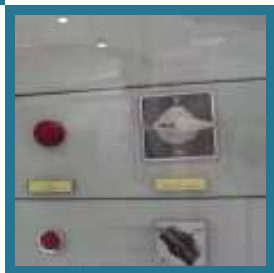
Column Platen Status



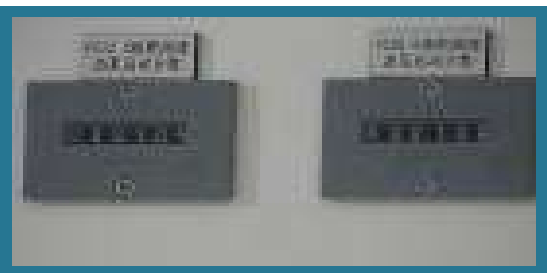
1-shaped Platen Status




Indicator Light




Handle Direction




Number Counter




Indicator Light



Switch Status

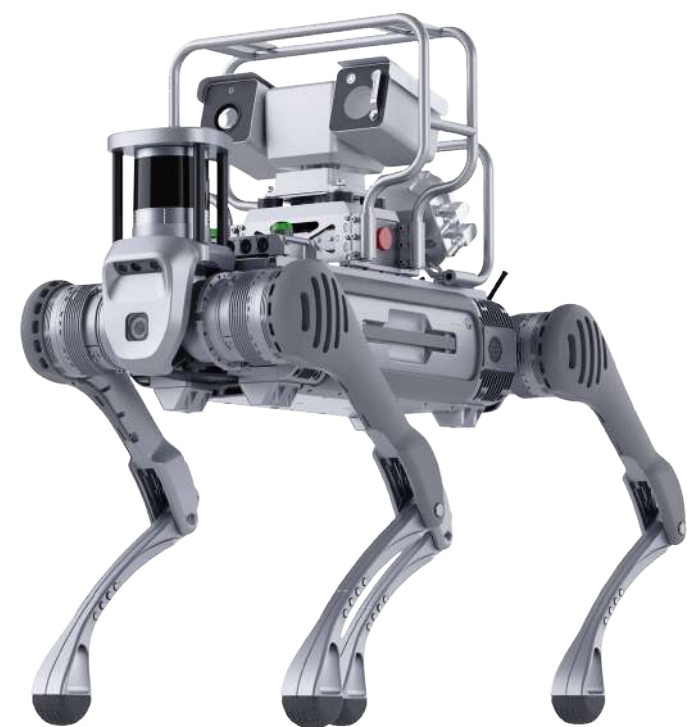


Text Status



Switch Status

Introduction to Hardware Platform



CONTINUOUS LOAD

≥ 40kg

WEIGHT

≤ 65kg

BATTERY

45Ah, 58V

ENDURANCE

4-6h

Size	1098×450×950mm
Obstacle Crossing	40cm
Climbing Angle	45°
Stair Climbing	Stairs of 25cm
Working Temperature	-40°C~55°C
Inspection Speed	≤3m
Laser	32 line



32-line Lidar

70° vertical field of view, 55° overhead view, eliminating blind spots
Used for navigation, positioning and terrain detection.



Ultra-wide-angle 360° Lidar

32-line laser fusion navigation, adaptable to all terrains.



Dual-light PTZ

Combined with AI intelligent recognition algorithm, it can realize functions such as substation equipment detection and infrared temperature measurement.



128 Microphone Arrays Integrated

Partial discharge fault monitoring for transformers, switch cabinets and other equipment.

Flexible Deployment

- Dual-light PTZ
- Acoustic Imager
- Four-in-one UV PTZ
- Robotic Arm
- Gas Sensor
- Partial Discharge Sensor

Basic Version



Enhanced Version



Simplified Version



Collaborative Version



Ascending Version



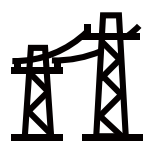
APPLICATION SCENARIOS

Unitree quadruped robot inspection solution is industry-oriented and used for inspection of various environmental equipment above and below ground. Compared with traditional inspection robots (wheeled and crawler-type), quadruped robots can adapt to different terrains, such as stairs, Stairs, slopes, mountains, etc.

Equipped with various testing equipment, it can complete a series of tasks like intelligent inspection, security patrol, search and rescue, smart construction, etc., providing services for the power, coal, mining, steel, railway, and petrochemical industries.



Outdoor Application



Power Grid



Power Station



Petrochemical



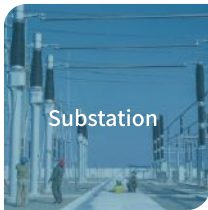
Railway/coal Mine



Pipe Gallery



Factory



Substation



Booster Station



Oil Plant



Traction Substation



Integrated Pipe Gallery



Science Park, Factory Area



Converter Station



Power Station



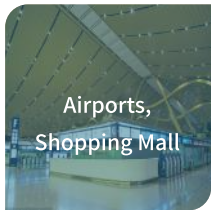
Well Site



Power Station In Coal Mine



Power Tunnel



Airports, Shopping Mall



Basement Gallery



Gas Plant

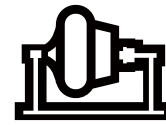


High-grade Residential Estate

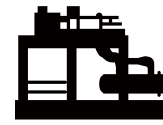
Indoor Application



Power Grid



Power Station



Petrochemical



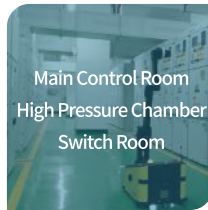
Network Operator



Railway/Subway



Substation/Coal Mine



Main Control Room
High Pressure Chamber
Switch Room



GIS Room



Pump Room



IDC Data Room



Dispatching Computer Room



Power Distribution Room
(airport/community/
government unit)



GIS Room
Relay Building



Turbine Floor
(zero meter floor)



Heat Exchange Unit



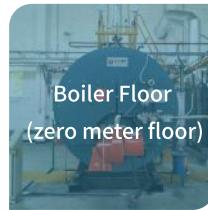
Electrical Equipment Room
Decompression Room



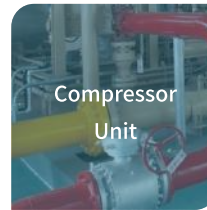
Underground Mine,
Low Voltage Distribution room



Distribution Room
Switching Station
Panel Room



Boiler Floor
(zero meter floor)



Compressor Unit



Traction Substation



Distribution Room in Mine

CASE INTRODUCTION

01

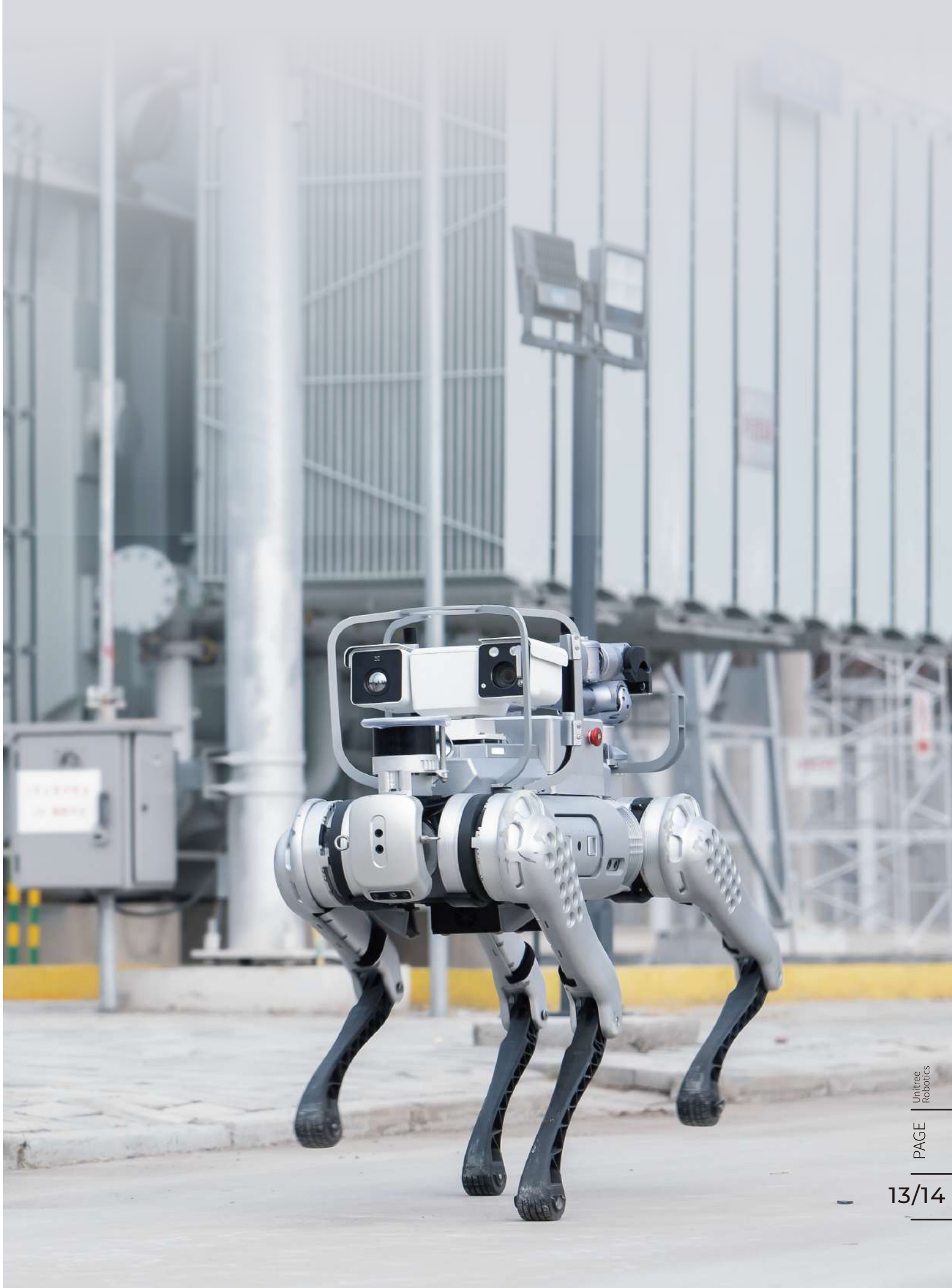
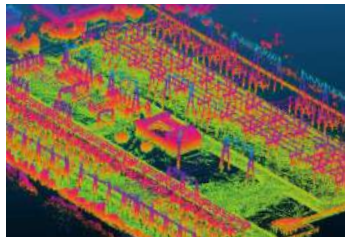
A Power Grid substation of 220kV in Inner Mongolia

Case:

This project is mainly performed in outdoor areas of 220KV and 110KV, the indoor 10KV power distribution room, the main control room and the relay protection room. The robot patrolling areas involve stair ramps, mouse guards and doors.

Effect:

According to the project requirements and the actual situation on-site, a quadruped robot B1, equipped with a 3D laser radar, a dual-light PTZ, a robotic arm, a charging room and a wireless module, etc., is selected to realize the robot walking and charging autonomously in the inspection area. The PTZ camera detects the data and status of instruments. And the robot identifies the abnormal status. The robot can also close the switch automatically through the added robotic arm. Through the wireless communication module, people in the control room can check the self-service operation and real-time inspection of the robot, fully realizing the self-service intelligent inspection on-site.





An UHV substation of 500KV in Hubei

Case:

This project is mainly performed in outdoor areas of 500kV.

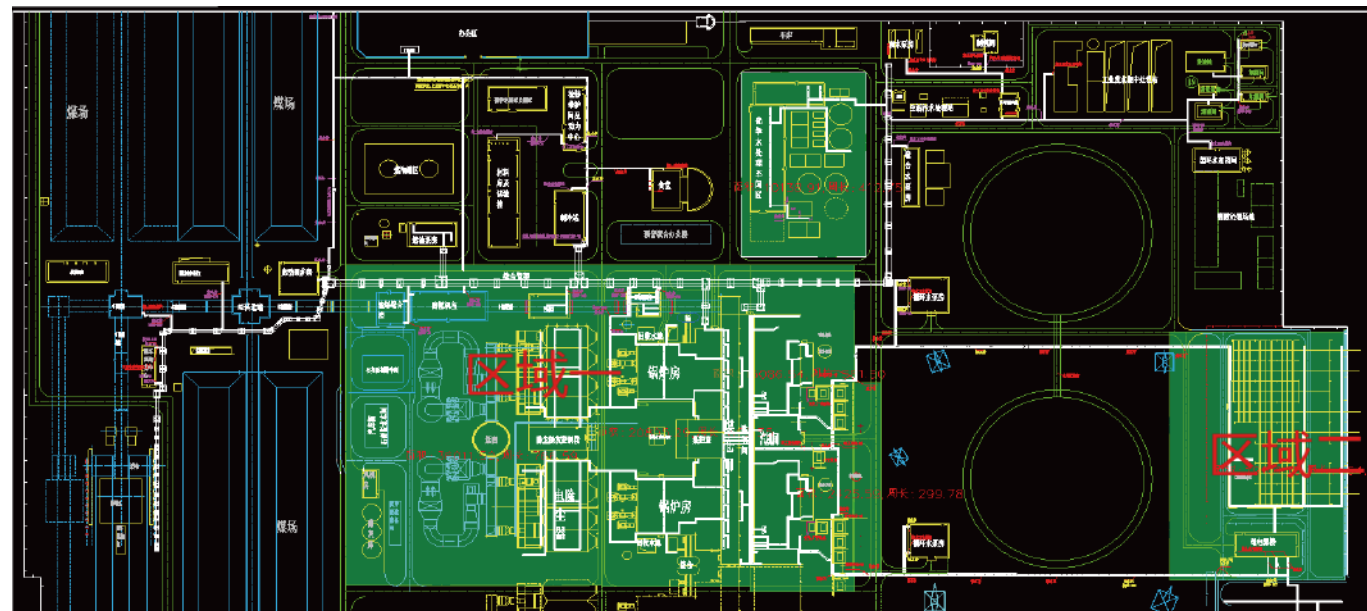
Effect:

According to the project requirements and the actual situation on-site, a quadruped robot B1, equipped with a 3D laser radar, a dual-light PTZ, a charging room and a wireless module, etc., is selected to realize the robot walking and charging autonomously in the inspection area. The PTZ camera detects the data and status of instruments. The robot can also close the switch automatically through the added robotic arm. Through the wireless communication module, people in the control room can check the self-service operation and real-time inspection of the robot, fully realizing the self-service intelligent inspection on-site.



02 CASE INTRODUCTION

An UHV substation of 500KV in Hubei



CASE INTRODUCTION

03

A thermal power plant in Hebei

Case:

This project is mainly performed in outdoor areas of 220kV booster station, boiler room, turbine room and other related facilities.

Effect:

According to the project requirements and the actual situation on-site, a quadruped robot B2, equipped with a 3D laser radar, a dual-light PTZ, an acoustic imager, a charging room and a wireless module, etc., is selected to realize the robot walking and charging autonomously in the inspection area. The PTZ camera detects instrument data and status of, partial discharge and gas concentration. Through the wireless communication module, people in the control room can check the self-service operation and real-time inspection of the robot, fully realizing the self-service intelligent inspection on-site.

CASE INTRODUCTION

04

A power station of a petrochemical plant in Guangdong

Case:

The project is performed in the production area of #5/#6, #7/#8, #9/#10 generating units on the zero-meter floor of the power plant.

Effect:

According to the project requirements and the actual situation on-site, a quadruped robot B2, equipped with a 3D laser radar, a dual-light PTZ, an acoustic imager, a charging room and a wireless module, etc., is selected to realize visible light pointer reading, liquid drip monitoring, temperature detection by infrared thermal imaging, and gas leakage monitoring by acoustic imager. In this way, a closed loop of business and data is formed to reduce costs and increase efficiency. It manages the discovery, processing, summary, analysis of inspection anomalies, realizes multi-layer monitoring of GIS room, and improves the costs of management and maintenance of robot solutions.



CASE INTRODUCTION

A steel hot rolling mill in Shanghai

Case:

The project is mainly performed in the daily inspection of 1880 heating furnace area of the hot rolling mill, to monitor abnormal steam leakage at the bottom of the furnace.

Effect:

According to the project requirements and the actual situation on-site, a quadruped robot, equipped with a 3D laser radar, a dual-light PTZ, and a wireless module., is selected to complete the furnace bottom inspection. Through improving the inspection mode, enhancing the intelligent level, raising the inspection effectiveness and management efficiency, intelligent diagnosis of key equipment can be finally achieved based on the data model.



06

A brewery in Hubei

Case:

The project is mainly performed on instruments, pipes, valves, motors and other equipment in the power workshop on the zero-meter floor of the brewery.

Effect:

According to the project requirements and the actual situation on-site, a quadruped robot, equipped with a 3D laser radar, a dual-light PTZ, and a wireless module, etc., is selected to carry out autonomous inspection in the power workshop (BTS is not included in this issue). According to the actual layout of the workshop, autonomous navigation and obstacle avoidance are completed. And the inspection view is remotely transmitted to the user terminal in real time.



Partner Customers

With self-developed core components, control algorithms, perception systems and other technologies, Unitree has cooperated with many top universities and industry-leading technology companies.

It not only provides customers with technical support such as software development and mechanical programming, but also helps customers configure a lot of external equipment. Quadruped robots have been used in many application scenarios such as security inspection, ground exploration, and detection.

Robot technology has become an important force in promoting innovation and upgrading in various industries. Currently, hundreds of customers in petrochemical, security, electric power, education and other industries are using Unitree robots.

Unitree is committed to providing mature solutions and thoughtful technical services to empower industry development, to create an intelligent future with you together.

