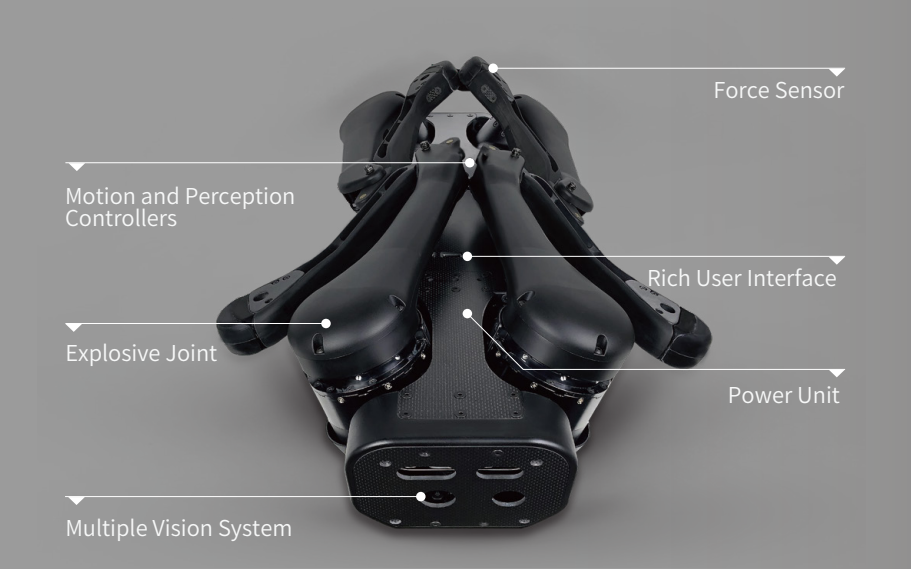# Génération ROBOTS

AlienGo

宇树科技

Manufacturer of Excellent Motion Performance Robots

Unitree Robotics is a well-known start-up company in the world of robotics, an outstanding pioneer in the marketization of global high-performance quadruped robots, fully committed to promoting mobile robots to truly enter people's lives.

Product Introduction

Force Sensor

Motion and Perception Controllers

Rich User Interface

Explosive Joint

Power Unit

Multiple Vision System

Innovation

Compared with traditional inspection robots (wheel-type and crawler-type), quadruped robots have discrete footholds and can adapt to different terrains, such as stairs, steps, slopes, mountains, etc.

Practical

It can be equipped with various instrument and testing equipment such as GPS, robotic arm, lidar, etc., to complete a series of tasks (such as smart construction, exploration, search and rescue, security inspection, etc.).

Environment

Lithium ion battery-powered, can be used circularly; fuselage is composed with polymer plastic, carbon fiber and other aerospace aluminum these environmentally friendly materials.

Craft

The newly designed power system is more lightweight and integrated, the joint cables are built-in, and the joint is integrated with overload protection, which improves the life of the reducer and enables the reducer to withstand severe impact loads.

AlienGo Technical Parameters

| FUNCTION	PARAMETER
Machine Weight (with Battery)	19±1kg
W×H×D(Stand)	0.65*0.31*0.6m/ 2.1*1.0*2.0ft
W×H×D(Folded)	0.60*0.31*0.15m/ 2.0*1.0*0.5ft
Load Capacity	13kg
Maximum Walking Speed	>1.8m/s
Slopes Ladder Height	≥ 25° 18cm
Operating Time	2.5-4.5h
Battery Capacity	12600mAh
Total DOF	12
Protected Mode	Emergency stop, fall protection
Alarm System	Voltage, temperature, circuit, charging alarm
All Motor Cables Built-in	Support
Excessive Torque Protection	Support
Reducer Wear Protection	Support
HD Video Real-time Transmission	Support
Power Outputs	5V，12V，19V，BAT (24V~30V)
Abundant External Interface	FE×2, HDMI×2, USB 3.0×2，RS 485×1
Encoder for Each Joint	Motor Encoder × 1, Output Encoder × 1
Perception module	Depth camera(2 unit), visual odometer camera(1 unit). as standard
	Lidar: single line or multi-line. as optional
No. of Foot Force Sensors	4 (Can greatly reduce the difficulty of developing and writing landing detection programs)
RTOS	Motion control：Ubuntu (real-time) Environmental awareness：Ubuntu-ROS
Have and support developmental sports functions	1.Walk, jump and run; 2.Go up and down steps, slopes and stairs; 3.Recover from a fall; 4.Support the development of walking and running gait and other high-performance .

*This manual will be modified according to product improvement, specification change and other reasons without notice.

Intelligent Perception System

Lidar

Depth Camera

HD vision Transmission

Environmental Awareness

Depth Camera	Global shutter and wide field of view.
	The minimum sensing depth is about 0.11m.
	Resolution depth output up to 1280 x 720 .

Visual Odometer Camera	Highly optimized V-SLAM, loop offset is less than 1%.
	The delay between posture action and action reflex is less than 6 milliseconds.
	Fisheye lens imager, hemispherical 163±5° field of view, stable tracking target.

APP
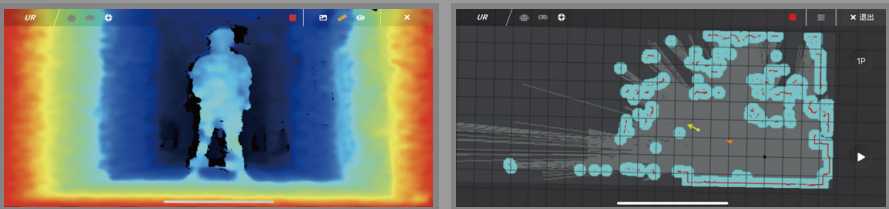
Visual mileage

Navigation planning

Human Posture Recognition Tracking and Face Recognition

1.Body Posture Recognition

The color camera can identify the specific posture of the person according to the deep learning model, and conduct human-machine interaction. The robot can make corresponding movements according to different body postures.

2.Human Skeleton Perception

The robot can analyze and calculate the two-dimensional skeleton information of the human body according to the color information from the perspective, and further analyze and calculate the three-dimensional skeleton information and motion information of a specific character using depths of field.

3.Target Person Tracking

When there is more than one person in the scene, someone can tell the robot to lock he/she by a certain posture (for example, raising the left hand). Thereafter, the robot will follow the movement of the target, even during the movement.
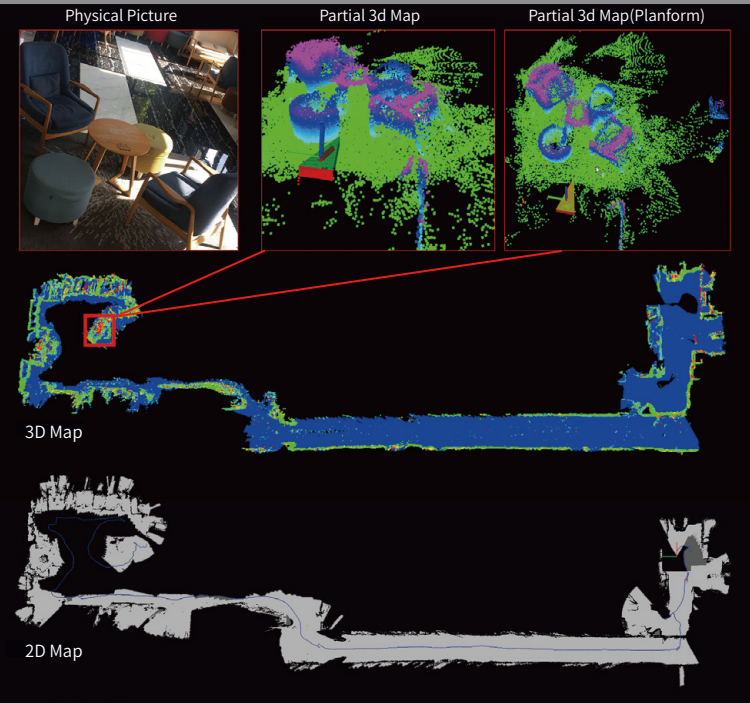

4.Face Recognition and Appearance Determination (under development)

From the perspective of the robot, artificial intelligence algorithm is used to automatically conduct face recognition and crowd classification, and it can identify gender, age and outfits.
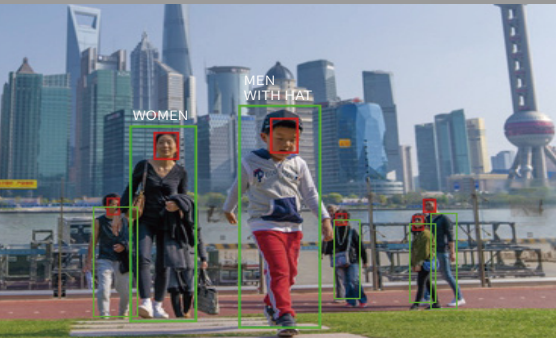
Depth Vision -3d Map Real-time Creation and Navigation Planning

3D Environment Construction

In the process of motion, the robot uses the cameras to obtain the color and depth information of the environment, and then reconstructs the 3D spatial information of the object with the help of a specific vision algorithm.

Probability Map

Octomap(probability map) are built by using cameras that detect the robot's surroundings as it moves provide back obstacle data.

Dynamic Obstacle Perception

When the robot encounters a dynamic obstacle, it will refresh the current map data within a certain range, thus discarding the "moving artifact" left by the dynamic obstacle on the map.

The Global Positioning

During the process of map creation,the global and local real-time positioning functions are available. The map will follow the camera's perspective in real time, and support real-time zooming in, zooming out, moving and arbitrary rotation.

Loop Detection

The robot can maintain a high loop-back accuracy in a wide range of fields, a high positioning accuracy within a certain range, and can maintain stability within a certain oscillation amplitude, with drift or loss.

Application

Research   Entertainment   Inspection   Exploration   Logistics   Care

Flexible mobility, excellent performance, suitable for mountain, jungle, grassland and other wild terrain.

Thanks to the good reliability and stability of the machine, it has super adaptability to irregular terrain.

Humans have a natural affinity for robotic dogs, making them suitable companions for family companionship and care.

Reliable mechanical structure and super - fast response algorithm, can achieve large jumps and obstacle jumps.

Accomplish tasks like patrol exploration, material transport in the fields of petrochemical, electric power, railway, mineral collection and so on.

The discrete landing point of the foot robot and Unitree self-developed multi-vision technology can quickly go up and down the stairs (different stair specifications have different performance).

Génération ROBOTS

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