pudu

BellaBot

An Innovative Delivery Robot

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About BellaBot

BellaBot

An Innovative Delivery Robot

The latest delivery robot designed by Pudu, BellaBot inherits the outstanding characteristics of the previous generation, while being endowed with superior human-Robot interaction capabilities. Featuring an innovative bionic design language, cute modeling, AI voice functionality, multi-modal interaction and many other new functions, BellaBot provides users with an unprecedented food delivery robot experience

Product Overview: BellaBot Robot

3D Obstacle Avoidance Sensors

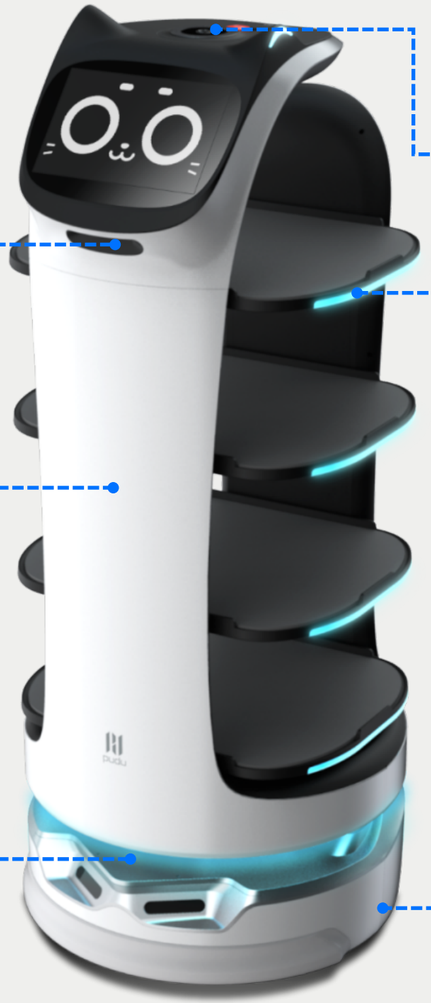
Comprised of the RGBD camera on BellaBot's neck and two sets of cameras on its chassis, which provide BellaBot with full-dimensional perception

ABS Industrial Plastic/Aviation-Grade Aluminum Alloy

Structurally stable, oxidation-resistant, and corrosion-resistant

All-New Lidar

Customized lidar with more accurate detection



Visual Camera Positioning

The infrared camera on top of BellaBot provides real-time positioning in order to create a complete visual positioning solution

Infrared Induction Tray

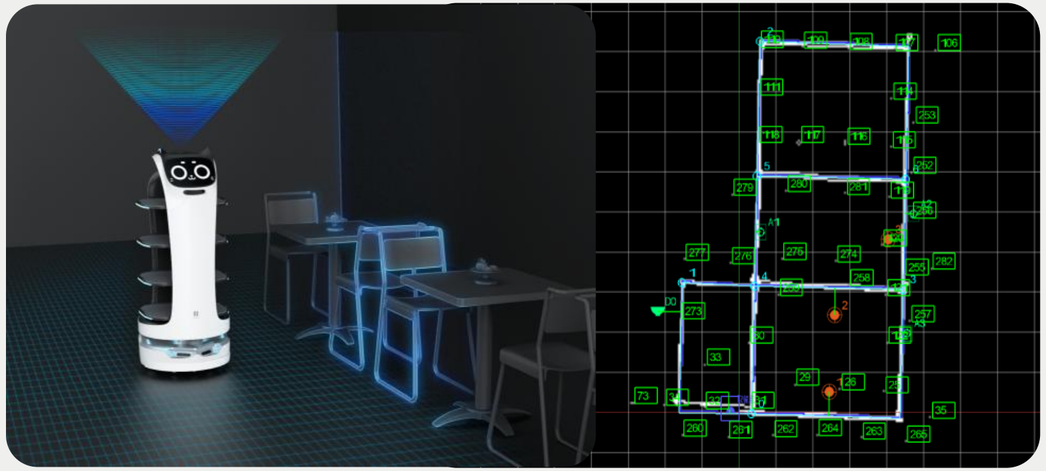
An originative new induction tray which intelligently perceives the tray's load, and ensures higher efficiency of distribution

All-New Independent Suspension

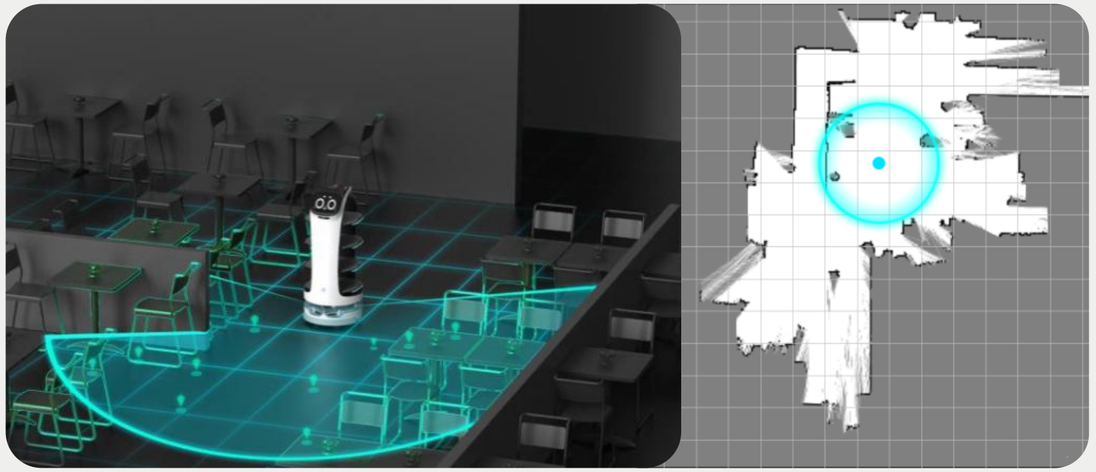
Auto-level independent linkage suspension system with high effectively to avoid bumps

Product Overview: BellaBot Robot

BellaBot Standard



BellaBot Advanced



Note:

- We offer two distinct versions of BellaBot to choose from which different positioning methods
- The standard version is based on a visual SLAM Marker solution, whereas the advanced version is based on laser SLAM
- In addition to the different positioning methods, the two versions of BellaBot provide the same standardized delivery service. You can choose different versions of BellaBot based on the actual conditions of the environment

Product Overview: BellaBot Robot

Category	Specifications	Description	Comment
Exterior and performance	Machine dimension	• 565×537×1290 (mm)	
	Tray size	• Tray size 410mm×500mm • Loading dimension: 385mm×480mm	
	No. of trays and tray height	• Standard 4-layer tray, with a height of 230/200/200/180mm from top to bottom	
	Robot weight	• 57kg	
	Load capacity	• Max 40kg, tray load 10kg/layer	
Power adapter and battery	Battery capacity	• 25.2V/25.6Ah	
	Quick-release battery	• Power exchange technology allows for easy removal and replacement of the battery to ensure BellaBot's continuous operation	
	Battery Life	• 12-24 hours	
	Charging time	• 4.5H	
Movement functions	Location positioning	• Advanced: no specific requirement for the height, but a standardized environment is required • Standard: a height of 5 meters, and a code sticker is required	• Standard version and advanced version do not support dispatching for the same area
	Perception	• Minimum size of object for obstacle avoidance: 35mm×50mm×100mm • Minimum clearance: 0.7m	
	Dispatching	• A maximum of 20 robots of the same version can be dispatched at the same time	
	Safety	• Speed: 0.5-1.2m/S (adjustable) • Climbing angle: ≤ 5º	

Product Overview: Application Scenarios

All Scenarios Covered

Pudu has independently developed a robot positioning and navigation technology based on multi-sensor fusion. BellaBot provides two positioning and navigation solutions: visual SLAM and laser SLAM
BellaBot can be used in restaurants, hotels, Bar, cafés, office buildings, and other business scenarios

Restaurant

Bar

Cafés

Hospitals

Hotels

Government buildings

Office buildings

Shopping malls

Product Advantages: BellaBot Robot

Why Choose "BellaBot"?

- **Riveting:** Able to comprehend, chat, act cute, and even get pettish sometimes[1]
- **Easy to Use:** Simple and easy to operate; a quick start within 2 minutes
- **Safe:** Smooth delivery free of collision or splash, with 0.5-second instant response to avoid obstacles
- **Reliable:** Use for a whole day on a 4.5-hours charge. Features exclusive power exchange technology
- **Durable:** Each robot passes a 73,000 km endurance test
- **Cost-Effective:** Efficient Delivery and easy maintenance

[1] Achieved through the robot's multi-modal interactive functions

Product Advantages: Contactless Delivery

In the post-epidemic era,"Contactless delivery" is becoming increasingly important in the intelligent delivery industry

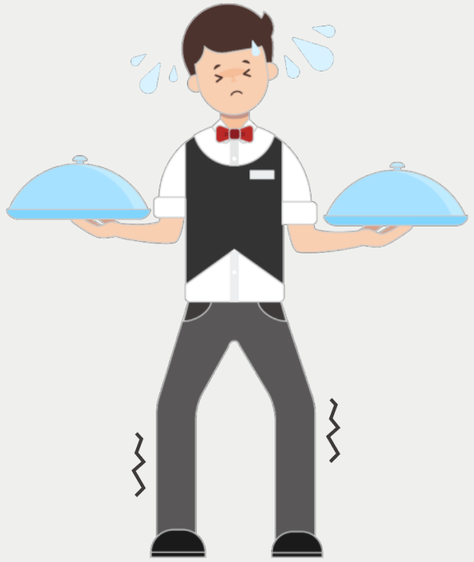
The COVID-19 has changed many aspects of production and people's lifestyle. As a result, the role of "contactless delivery" has become increasingly prominent. In restaurants, food is distributed to customers by BellaBot robots, which reduces direct people-to-people contact, while ensuring food hygiene and safety

Product Advantages: Efficient Delivery

BellaBot——Intelligent Delivery Expert

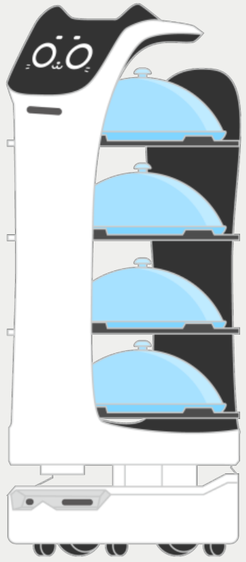
More deliveries

In restaurants, BellaBot can complete roughly 400[1] food and beverage deliveries every day, which frees waiters from the repetitive and laborious work of delivering dishes, so that they may have more time to focus on serving customers



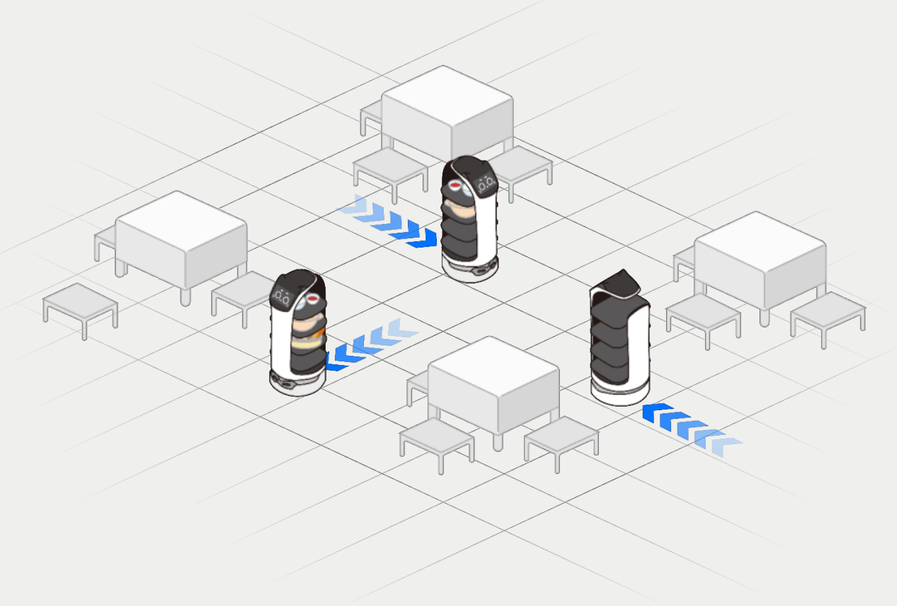
Larger loads

BellaBot features a large tray (41×50mm), which allows for a single tray to provide twice the carrying capacity as a manual delivery



Coordination among multiple robots

BellaBot features a multi-robot delivery mode, which supports up to 20 BellaBot robots operating at the same time. BellaBot can easily handle any scenario from a small venue of a few hundred square meters to a space larger than ten thousand square meters



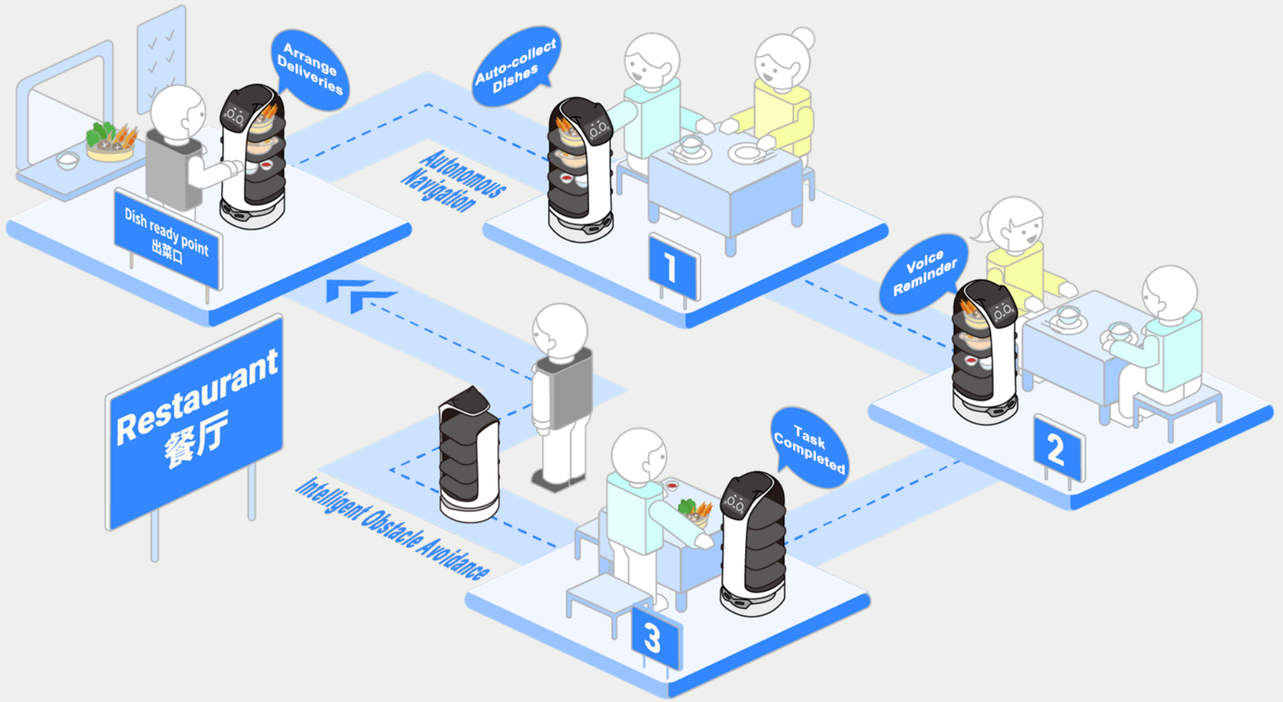
[1] Data sourced from the Pudu cloud platform backend integrated operations data in more than 30 countries

Product Advantages:·Ample Augmentability

Hassle-Free Delivery

What Can "BellaBot" Do?

- BellaBot can provide efficient delivery services for dishes, tableware, handkerchiefs, documents and other items
- Arrival notice: Table number voice reminder, and accurate arrival at the target table
- Light effect prompts: Prompting the guests to pick up the dish with flicking lights on the tray
- Greet and guide: Greeting guests at the door and guiding them to their table



Advantages of BellaBot Delivery

· Simple operations
· Ultra-long battery life
· Stable and efficient
· Multi-robot cooperation

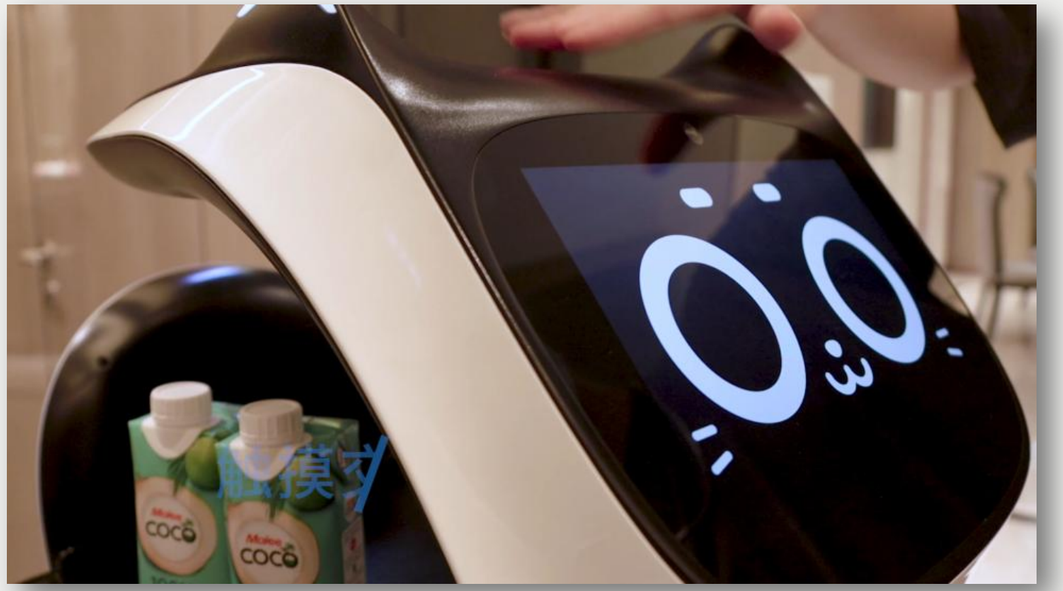
Product Feature · Smart BellaBot

Cute, likeable and smart

- **Cute& Chubby:** Inspired by the image of a popular pet cat, BellaBot stay ahead of the curve with our bionic design. A smooth and aesthetic is only fitting for a likeable robot

- **Talking& Considerate:** BellaBot's AI voice system enables voice dialogues between the robot and human beings in different contexts. The exclusively customized voice is adorable

- **Smart& Sweet:** When you touch BellaBot's ears and forehead, it would respond with different expressions and voices



Product Advantages: Outstanding Safety Functions

Why Does BellaBot Have Such Outstanding Safety Functions?

3D obstacle avoidance technology to ensure safety

RGBD depth camera

3* RGBD depth camera
provide BellaBot with the strongest three-dimensional perception to date
It can accurately detect and stop when encountering obstacles with a response time as short as 0.5 seconds

A front detection angle up to 360°
and a front obstacle detection range exceeding 10m

The minimum height for object detection is 20cm
with an obstacle scanning frequency as rapid as 5400 times/min

Flexible obstacle avoidance and intelligent path planning

Integrated obstacle recognition rate of 99% for accurate obstacle avoidance with no "dead spot"
Intelligent route planning; the optimal route to perform tasks is selected based on the operating environment

Product Advantages: Superlative Trafficability

Why Does BellaBot Have Superlative Trafficability?

A minimum clearance at 70cm; compact environments can be easily navigated

Premier sensor featuring Pudu's SLAM algorithm, BellaBot has a minimum clearance of 70cm

Meets 99% of scenarios involving required space in passageways
Flexible and efficient; can be used in compact environments

Auto-level independent linkage suspension for stable, non-spill delivery

Auto-level adaptive variable suspension. Damping can be altered according to different floor conditions and driving requirements
The resonance frequency is maintained at an optimal state

It can surmount obstacles with a height of 1cm
Safe delivery of dishes
Driving stability has been improved by 50%

Product Advantages: Operable Around the Clock

Hassle-free Battery Replacement

Power Exchange Technology

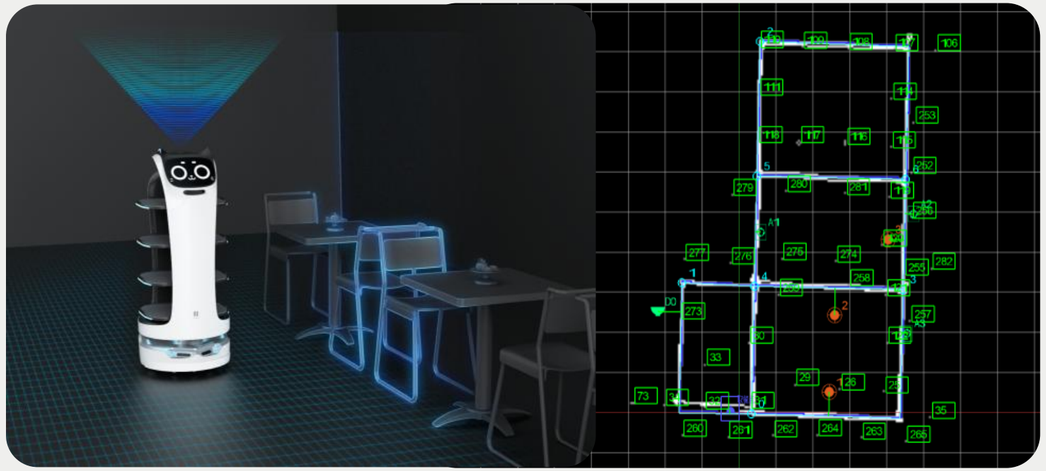
Charging and usage scenarios are categorized for faster battery replacement.

24/7 operations: a piece of cake for BellaBot

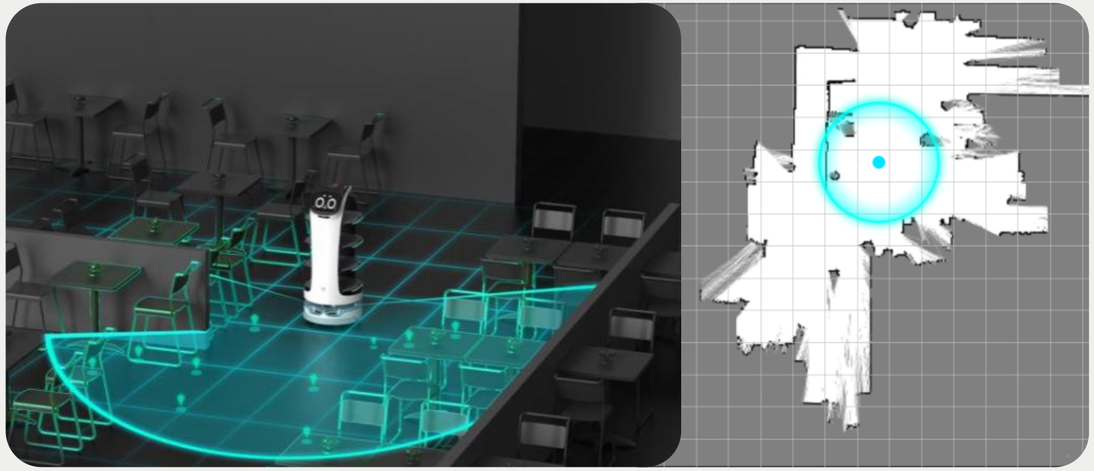
Product Advantages: Dual Positioning and Navigation Solution

Laser SLAM and Visual SLAM
Dual Solution for Full Coverage in Any Scenario

- BellaBot provides two SLAM navigation solutions according to the user's particular scenarios, both of which are accurate and easy to use
- Both positioning solutions which BellaBot offers provides the same excellent user experience. While the positioning solutions differ, BellaBot's customer-centered service never changes



Standard



Advanced

Product Advantages

What Other Powerful Capabilities Does BellaBot Have?

Interaction Through Light Effects

Different tasks trigger corresponding light interactions; BellaBot's ears and tail can display its operation status in real time, and instructions are clear

Intelligent Induction Tray

Modular structure for quick disassembly and intelligent infrared induction
A smarter tray for more efficient delivery

Product Advantages: Safety Certifications

BellaBot robot has received KC certification from Korea, CE certification from the EU, FCC certification from USA, RCM certification from Australia, and NCC certification from Taiwan, China
IMDA certification from Singapore, MIC/TELEC certification from Japan, CR (China robot certification) and many other certifications both domestically and abroad to ensure the safety and compliance of our robots

INFOCOMM MEDIA DEVELOPMENT AUTHORITY

Upgraded New Functions

BellaBot Has Many More Service Capabilities

MIR System - Hassle-Free Online Upgrades

Calling via App

Calling via mobile phone and other devices
Real-time control; BellaBot can be summoned to serve guests at any time

Customized voice packs

Online upgrades, real-time synchronization
Great voice system

Door greeting and escorting guests to their table

BellaBot can take over reception and escort guests to their table
It can move to a designated position

Upgraded New Functions

BellaBot Has Many More Service Capabilities

MIR System - Hassle-Free Online Upgrades

A height up to 8m

Indoor environments with a height of up to 8m; it can be utilized in hotel lobbies (standard version)

Flexible table number entries

User-defined input for table numbers and table numbers can be effortlessly selected and changed

Switch between multiple maps

Switch between maps for multiple scenarios
No need to repeatedly input a map (standard version)

Pudu Service: PUDU Robot Open Source Platform

PUDU Robot Open Source Platform

The Pudu Robot Open Source Platform enables developers to achieve functions such as remote control, task input, status monitoring and much more via different interfaces

RESTfulISDK

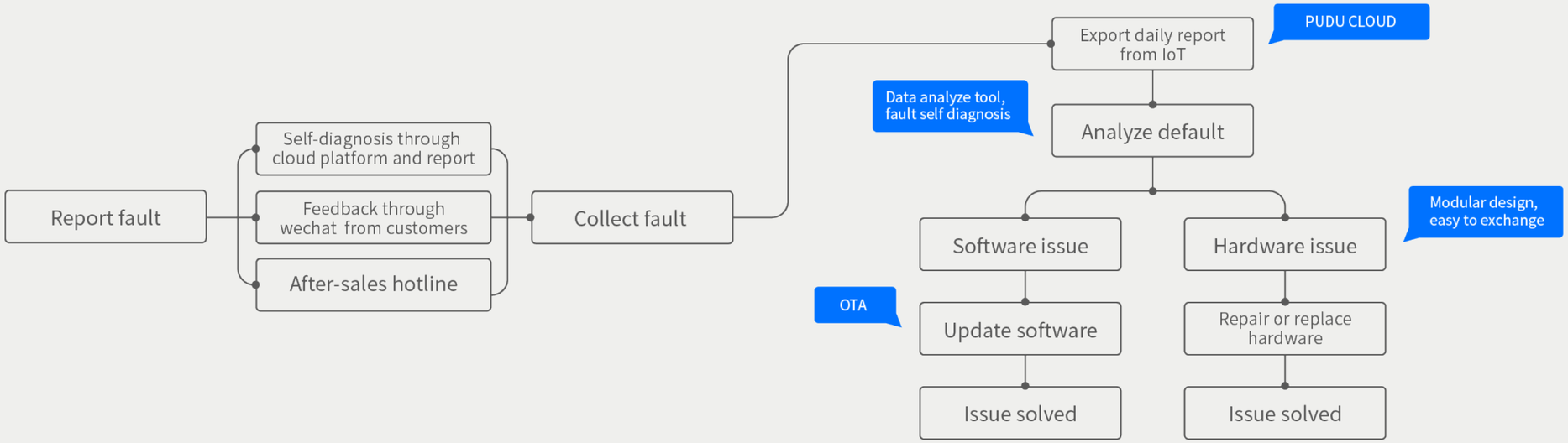
SDK remote control solution

AndroidSDK

Supporting Service · Remote Fault Detection

PUDU IoT cloud service could solve over 90% of technical faults

- Real-time fault detection and reporting via the cloud platform: Not rely on clients' feedback, timely respond to and handle the faults
- Analyze and handle faults online: Locate the fault module precisely and handle over 90% of the faults online by IoT
- Automatic fault diagnostic tools: Improve the fault handling efficiency and lower the after-sales cost
- Modular design: Make after-sales service easier and professional by streamlining the maintenance steps



Create Your Exclusive BellaBot

Customized Appearance

Enhanced Promotion
- Go harmony with the vibe of the restaurant
- Greater brand and service exposure

3-day production
- Modular production (needs confirmation-design-launch) takes 3 days at the fastest

Customized Voice Pack

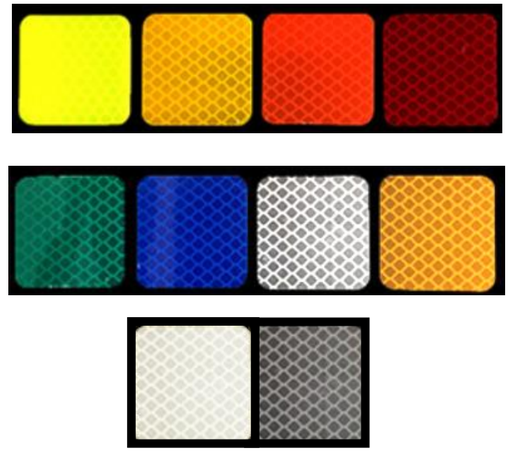
Cute girls

Cute boys

Sweet girls

Active boys

Multicolor Marker

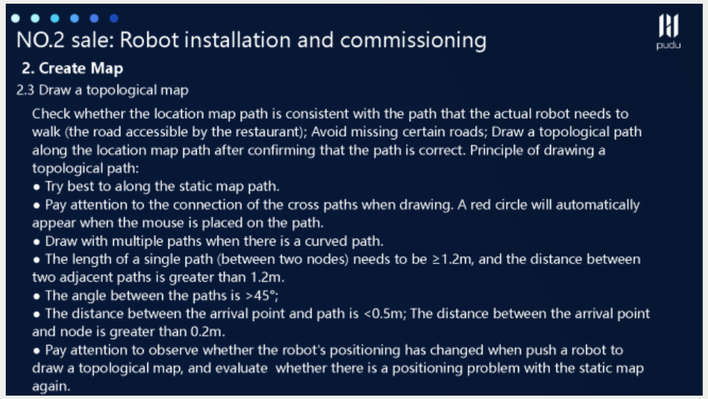


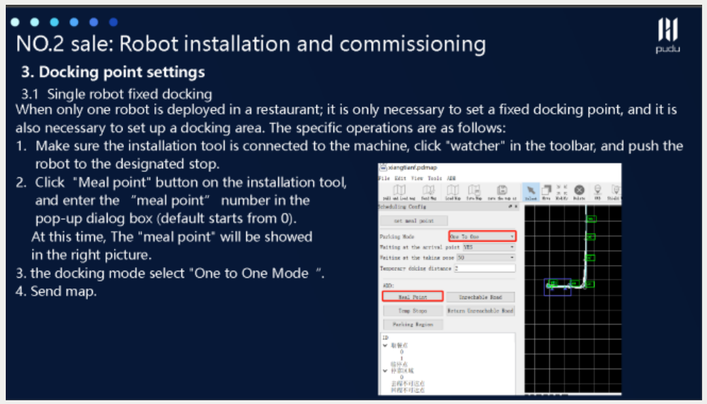
Notes: The colors are subject to the actual marker

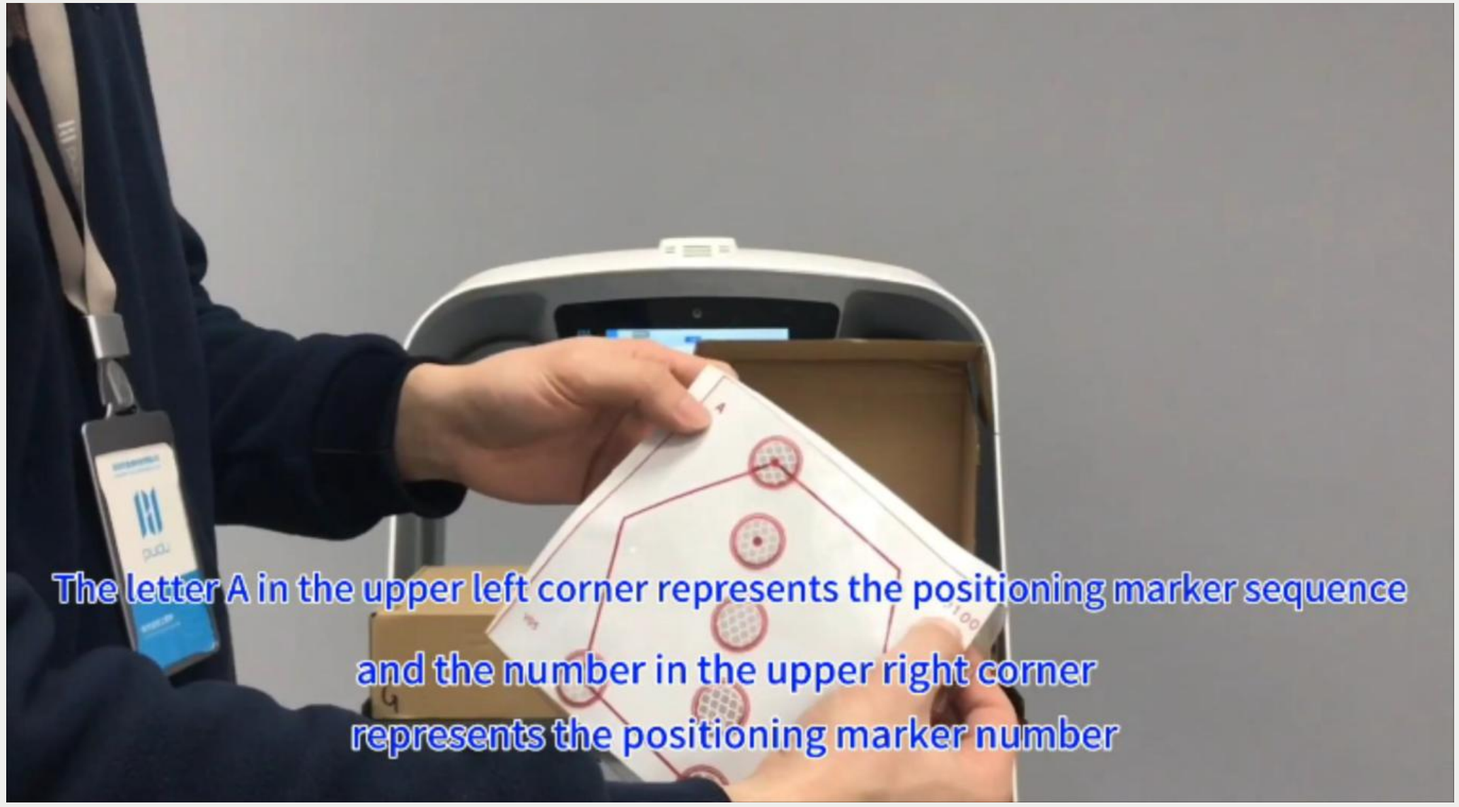
Supporting Service · Installation Training

Pudu Robotics provides diverse training methods and tutorials

With a strong after-sales technical team, Pudu Robotics not only supports online installation training worldwide, but also provides diverse training materials







Supporting Service

Friendly, Convenient and Professional

Thoughtful After Sales Service

1 year free warranty | Free Training | 7x12 Hours Service
IoT services: Solve over 90% technical issues online

Contact Us:
Email: global_sales@pudutech.com

Connect with Us:

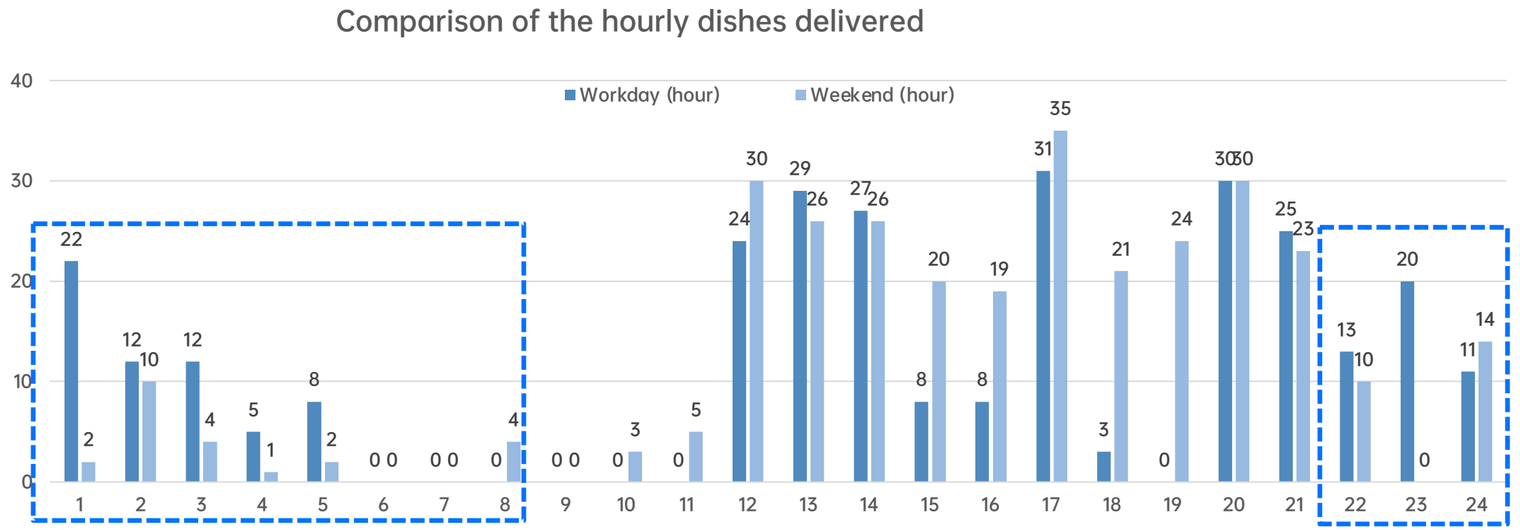
Pudu Robotics

Real data, more convincing

A restaurant in Shanghai:

Total area: 1000m²; dinnig area: 800m²
BellaBot's daily deliveries: 240 dishes

Tables: 60
Installed in 1 day



BellaBot replaced the delivery staff from 21:00 to 07:00 (second day)

About Pudu · Key Clients

About Pudu: Milestones

2016

- Pudu is established in Shenzhen

2017

- Pudu releases its first delivery robot - PuduBot
- Pudu enters the overseas market
- PuduBot robot receives the German Red Dot Design Award

2018

- Chengdu branch is established as the R&D center for the Pudu positioning algorithm
- Pudu's multi-scenario delivery robot, Gazebot, is launched in Shanghai
- Pudu is approved as a National High-Tech Enterprise

2019

- Annual sales of Pudu robots exceeds 5000 units
- Pudu launches its new residential delivery robot at CES - HoloBot
- Pudu establishes strategic cooperation globally with hotpot chain Haidilao
- Pudu establishes strategic cooperation globally with hotpot chain Xiabu Xiabu
- Pudu establishes Beijing branch office
- New delivery robot BellaBot and dish collecting robot HolaBot are released in Shenzhen

2020

- At CES 2020; BellaBot robot receives the CES Innovation Award
- In July, Pudu receives series B financing of more than 100 million yuan from Meituan
- In August, Pudu receives series B+ financing of nearly 100 million yuan led by Sequoia Capital
- During the COVID-19 outbreak, more than 300 Pudu robots are recognized and praised by the central government and Ministry of Industry and Information Technology for providing "anti-epidemic technology" to more than 100 hospitals and quarantine sites around China
- The number of employees exceeds 500
- The cumulative sales of Pudu robots exceeds 10,000 units

PUDU ROBOTICS

Shenzhen Pudu Technology Co., Ltd.

Founded in 2016 and headquartered in Shenzhen, the world capital for hardware innovation, Shenzhen Pudu Technology Co., Ltd. is a national high-tech enterprise engaged in the R&D, design, production and sales of service robots. Pudu has set up R&D centers in Beijing and Chengdu, and has service outlets in more than 60 cities throughout China.

Pudu Technology has developed core technologies such as low-speed automatic driving, robotics motor and motion control. Its main products include disinfection robots and delivery robots. Pudu ‘s robots are widely used in hospitals, restaurants, schools, office buildings, government buildings, Cafés, Bar and a variety of other environments. Our products are in great demand in more than 50 countries and regions around the world. Pudu enjoys cooperation with more than 5000 partners including main customers such as Haidilao Hotpot, Vienna Burger King, Aeon, Baskin Robbins and other well-known enterprises. In July 2020, Pudu obtained series B financing totaling more than 100 million yuan invested exclusively by Meituan. In August, it then obtained series B+ financing totaling around 100 million yuan, which was led by Sequoia Capital China. Pudu has also become a global benchmark enterprise in the field of disinfection and delivery robots

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