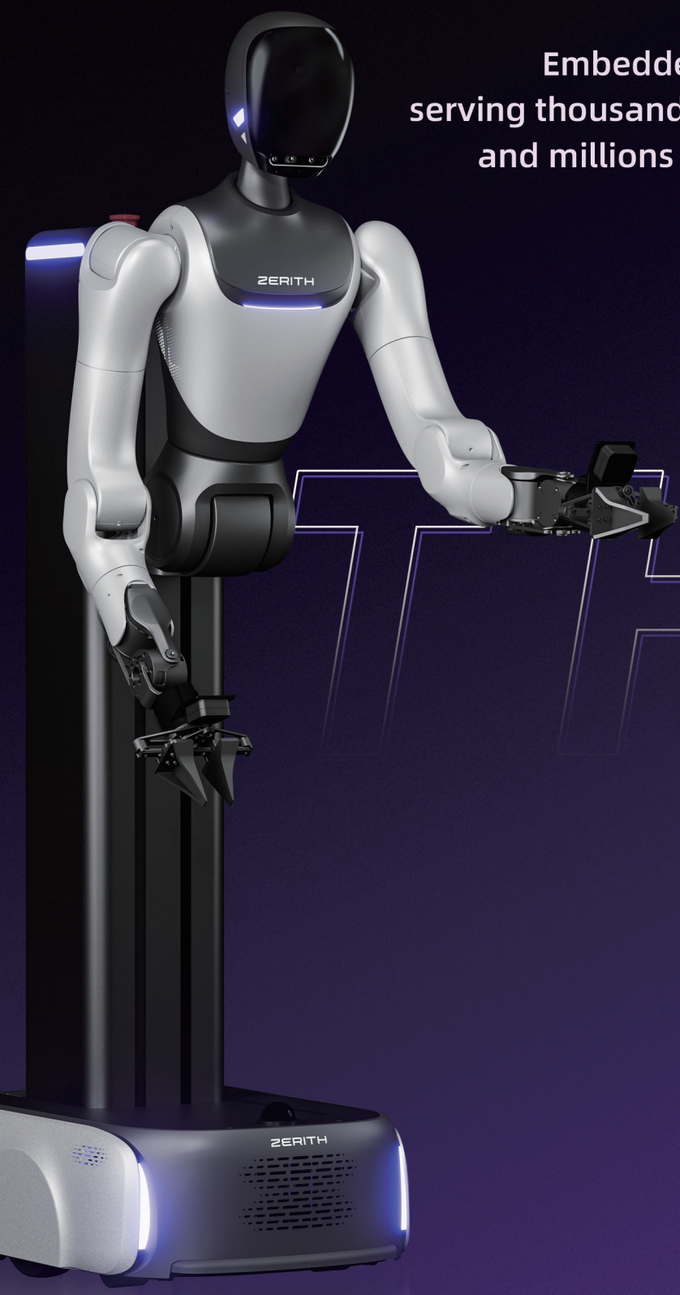
零次方
ZERITH

Embedded intelligence
serving thousands of industries
and millions of households



ZERITH

Address:
99 Longchuan Road, Baohe District, Hefei · Building B8, China Vision
9th-10th Floors, Tower A, R&D Building, Tsinghua Information Port, Nanshan District, Shenzhen
Contact details:
400-169-7658
Official website:
https://zerith.com/
Email:
business@zerith.ai

Embodied intelligence serves thousands of industries and millions of households

About ZERITH

Zerith is dedicated to bringing embodied intelligence to tens of millions of households.

The company's founding team hails fro... ...ghua University and possesses decades of accumulated expertise in core robotics technologies and practical engineering implementation. We have established end-to-end technical capabilities spanning motion control, embodied manipulation, and humanoid and wheeled-arm robot platforms, whilst independently developing a comprehensive toolchain covering data acquisition, training and inference.

Building on this solid technological foundation, Zerith has pioneered the execution of long-sequence, multi-task operations in specialised scenarios and is one of the few robotics companies in China to have successfully established a closed-loop commercial ecosystem. Currently, the company has established R&D and operational centres in Hefei, Shenzhen and Tokyo, Japan, forming an international collaborative network; our products have been deployed in over 20 landmark locations across key cities including Beijing, Shanghai, Guangzhou and Shenzhen, placing us at the forefront of the industry in terms of commercial coverage.

We firmly believe that intelligence stems from data. Therefore, Zerith Power is committed to driving large-scale deployment through mass production, gathering data from real-world operations, and using this data to drive technological iteration. By continuously pushing the boundaries of application scenarios, we aim to ensure that robots truly become a backbone force in serving humanity.

Tokyo, Japan

Hefei, Anhui

Shenzhen, Guangdong

"1+N+M" Global regional presence

1 application centre in Hefei
N R&D centres nationwide
M overseas expansion centres

"1+2+N" Product Portfolio Planning

"1" intelligent brain
"2" supporting software platforms
"N" physical hardware devices

Business Vision

Household cleaning



Home organisation

Home services

Supermarket order picking



Instant retail



Instant retail

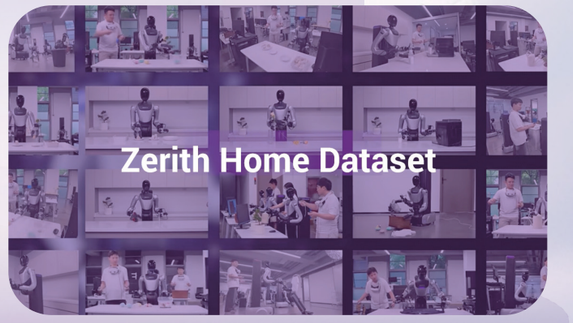
Robot Shop



Entity

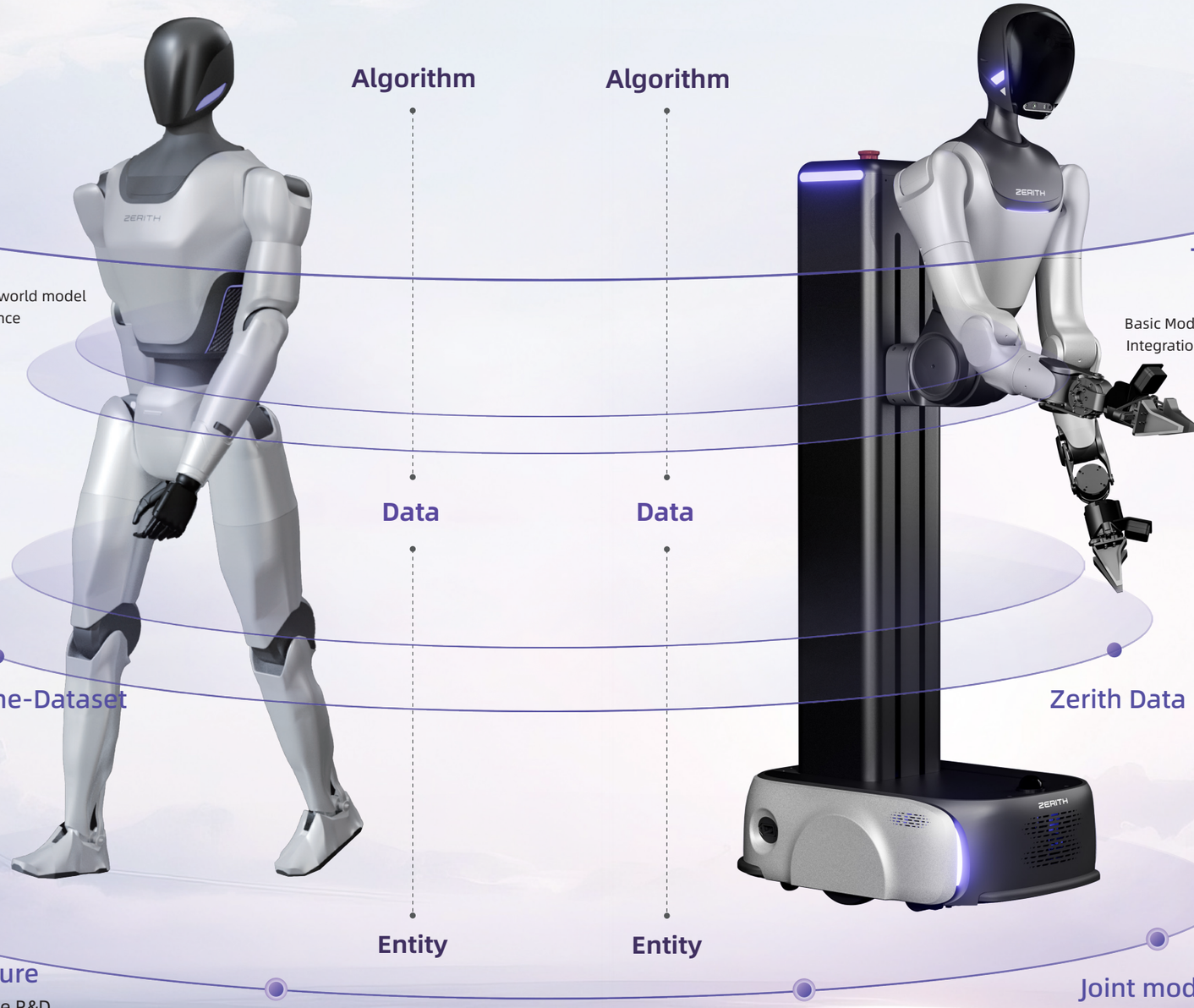


Algorithm



Data

In-house full-stack technology
Designed for embodied intelligence



Algorithm

Algorithm

Data

Data

Entity

Entity

Cerebellum: Precision Control

Reinforcement learning-based gait ·Active perception of the world model
Full-body anthropomorphic control · Dynamic balance

The Brain: The More You Use It the Smarter You Get

Basic Model for Domestic Scenarios · Memory-Enhanced Learning
Integration of Virtual and Real-World Data · Continuous Evolution

Zerith-Home-Dataset

Zerith Data

Mechanical structure

Multi-platform collaborative R&D
+ high-rigidity parallel design
Balancing lightweight
construction with high strength

Electrical system

EtherCAT real-time bus
Millisecond-level response times
Supports expansion and integration with external devices

sensor

Multimodal Sensing Fusion
(Tactile/Visual/Radar)

Joint module

High-speed communication + high dynamic response
Open low-level control interfaces

Wheel-arm humanoid robot　Zerith H1

Remote operation

Data collection

Long-sequence tasks in specific scenarios

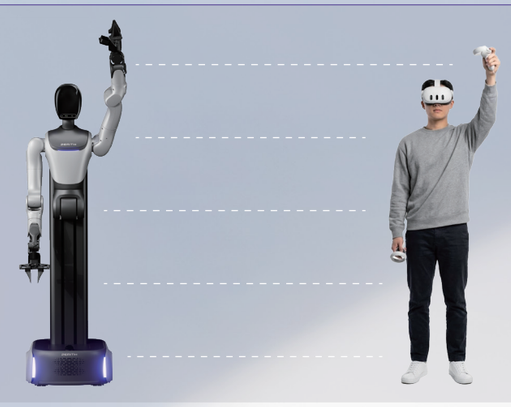


Basic parameters

Total degrees of freedom：23
Weight of the robot：129kg
Rated load per arm：1kg
Maximum load per arm：1.5kg
End-point repeatability：±0.15mm
Battery life：4~7h（It depends on how it is used）
Charging method: battery replacement + mains power
Connectivity: Wi-Fi, Bluetooth

External interfaces

Ethernet*2
HDMI*1
USB*1



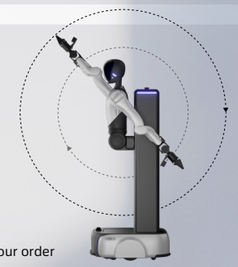
Millisecond-level
Full-body remote control

Millisecond-level motion synchronisation
Full-body motion control algorithm
Precisely matches human movements
making remote operation intuitive from the very first use



Wide-ranging Agile operation

Opt for the dexterous hand to perform complex operations
6 degrees of freedom
Repeatability of ±1 mm
*Please enquire in advance when placing your order



Wide-ranging operational capabilities

7-axis high-precision robotic arm
Reach: 1788 mm
Reaches down to the floor
Reaches up to over 2 m



Omnidirectional Environmental
Perception System

Multimodal fusion for comprehensive
perception of the real-world environment
Enabling robots to see clearly,
recognise reliably and perform tasks effectively in complex scenarios



Data collection - Data cleansing - Quality control
Data annotation - Manual review - Data export

One-stop data acquisition management platform

Supports VR remote operation and
a proprietary data management platform
Effortlessly collect high-quality data

Easy to customise, endless possibilities for innovation

Python
End-to-end development

Fully open **SDK**

Fully open upper layer and lower layer interfaces

Complete and clear URDF

Provide a professional user manual

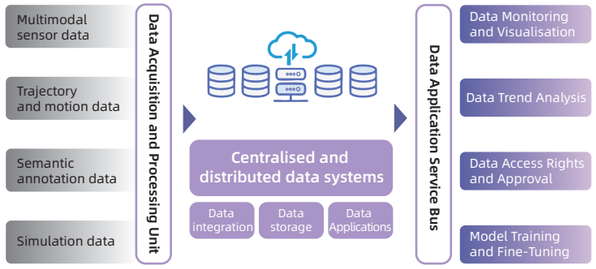
Supports mainstream simulation platforms

NVIDIA Isaac Sim, MuJoCo, Gazebo, etc.
Support for secondary development is continuously updated

Zerith Data

A one-stop robot data management platform designed to address the issues currently facing robot development, such as severe data silos, inconsistent data quality and broken data chains.





Functions

"Collect-Use-Manage" One-Stop Embodied Data Management Platform

Fully in-house developed technology stack: The platform's hardware, software and models are all developed in-house, enabling industry-leading ultra-low latency remote control of just 5ms in data collection scenarios, thereby ensuring high-quality and efficient data collection.
End-to-end closed-loop management: This covers the entire lifecycle from task creation and distribution, through data collection and processing, to data annotation, ensuring compliance with data collection standards and the reliability of results.

Unified management of multi-source, heterogeneous robot datasets

Cross-protocol compatibility: Supports mainstream robotics communication protocols such as ROS, ROS 2, CAN and MQTT, as well as data storage and management for mainstream robot platforms including Leju, Lingdong General and Zixianliang.

End-to-end management of multimodal data

Extensive data application capabilities: Supports two-way synchronisation between local and cloud data, features a comprehensive tag management system, and offers a panoramic preview of multimodal data, thereby significantly enhancing data application efficiency and user experience.
Precise manual annotation: Using video tracks as the annotation unit, it provides a variety of annotation tools including selection boxes, polygons, text, and fuzzy selection; supports atomic-level segmentation and precise management based on time frames.
Intelligent automatic annotation: Based on deep learning algorithms, it supports intelligent recognition and automatic segmentation of annotation objects; through end-to-end dynamic tracking technology, it achieves a significant leap in capability from static image annotation to dynamic video annotation, substantially improving annotation efficiency and consistency.

Project lifecycle management and detailed cost control

The platform must be centred on project delivery and support real-time monitoring of project operating costs;
by utilising datasets to establish standardised delivery and training modules, it enables closed-loop management of the entire project lifecycle, from initiation to delivery.

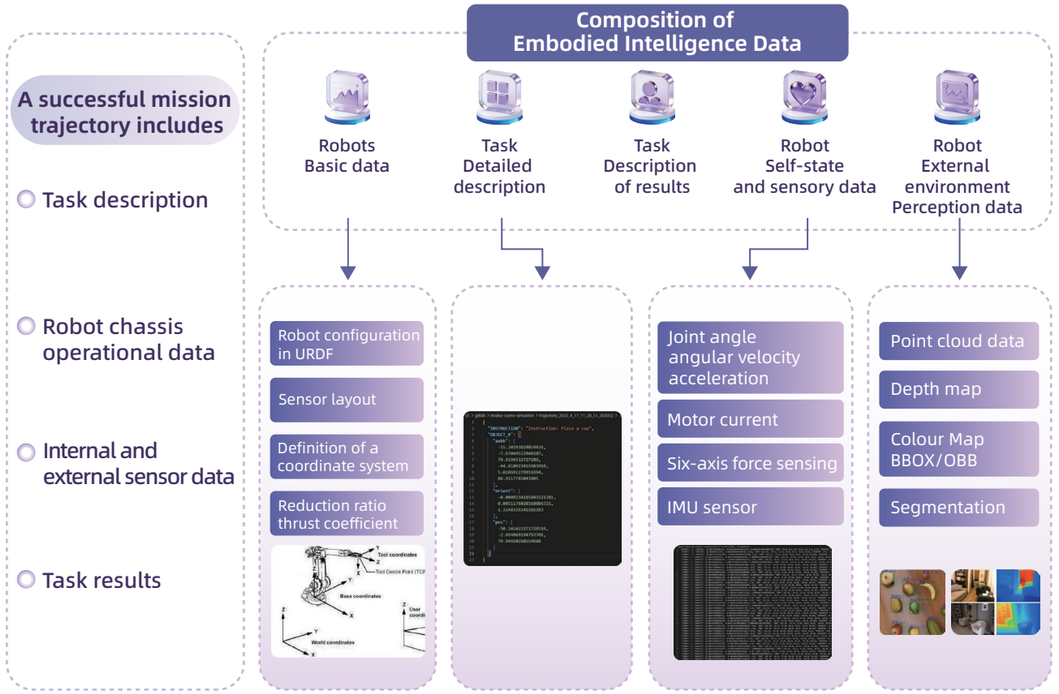


"Full-Modal" Data Collection Robot Zerith H1

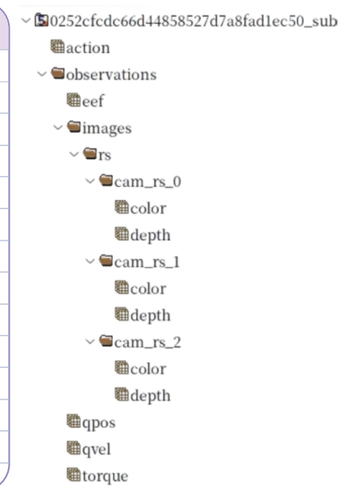
Real-world data Multi-modal dataset

A collection of data in various formats, systematically annotated and linked; by utilising a unified framework, it breaks down 'data silos' and provides the data fuel for embodied intelligence, thereby enabling the training of intelligent systems capable of deeply understanding the world and performing cross-modal reasoning and generation.

Data format



Project	data packet	Entity Information
1	"action/arm/position",	Motor positions on the arms: 7+7 (left arm + right arm)
2	"action/base/velocity",	Chassis speed: 2 (linear speed + angular speed)
3	"action/effector/position",	Gripper position: 2 (left gripper + right gripper)
4	"action/end/position",	End-effector pose (quaternions): 7+7 (left arm + right arm)
5	"action/head/position",	Head position: 2 (Yaw axis + Pitch axis)
6	"action/waist/position",	Waist position: 3 (Z-axis + Pitch-axis + Yaw-axis)
7	"observation/state/arm/position",	Motor positions on the arms: 7+7 (left arm + right arm)
8	"observation/state/arm/torque",	Arm motor torque: 7+7 (left arm + right arm)
9	"observation/state/arm/velocity",	Arm motor speed: 7+7 (left arm + right arm)
10	"observation/state/base/velocity",	Chassis speed: 2 (linear speed + angular speed)
11	''observation/state/effctor/position'',	Gripper position: 2 (left gripper + right gripper)
12	"observation/state/end/position",	End-effector pose (quaternions): 7+7 (left arm + right arm)
13	"observation/state/head/position",	Head position: 2 (Yaw axis + Pitch axis)
14	"observation/state/waist/position",	Waist position: 3 (Z-axis + Pitch-axis + Yaw-axis)



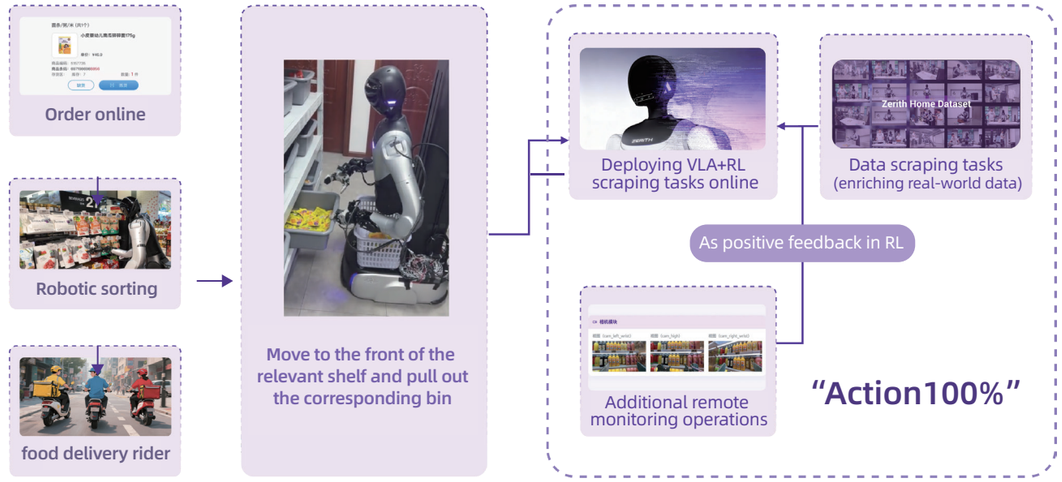
· Robot body data is stored in HDF5 or LEROBOT format.
· Image data comprises three viewpoints (head, wrist × 2) and includes both colour and depth information.

Instant retail solutions

Embodied Intelligence Reshapes the New Ecosystem of Instant Retail

With general embodied intelligence technology at its core, we are developing a front-end warehouse solution characterised by ‘fully automated processes, high efficiency and low costs, and adaptability to multiple scenarios’, thereby reshaping the new ecosystem of on-demand retail fulfilment and helping businesses secure a foothold in the trillion-yuan on-demand retail market.





Core technological support



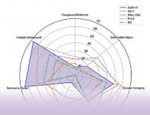
General-purpose embodied intelligence platform

Zerith H1 (Wheeled Arm Robot)
Human-like operation
Suitable for complex tasks across multiple scenarios



Advantages of the core algorithm

Steady-state floating-base model Ultra-high-precision robotic arm planning
Derived from aerospace technology, with industry-leading operational precision



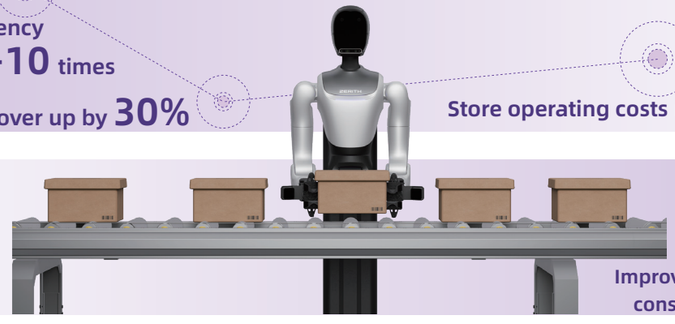
Action 100%Technology

The first in China to achieve continuous operation of long-sequence tasks in specific scenarios with an autonomous operation success rate that ranks among the best in the industry

Customer feedback

Settlement efficiency improved by **5–10** times

Store turnover up by **30%**



Store operating costs reduced by **15%**

Improving traffic generation and service consistency through the use of robots

Break-even in six months

3 minutes per order

1.7 man-hours per machine

improve efficiency

Optimal Paths and Dynamic Movement:
The scheduling algorithm calculates the optimal route in real time, with a movement speed of up to 1.5 m/s, resulting in a 150% increase in order fulfilment efficiency;

Overall efficiency improvements in automated warehouses:
Automated processes eliminate fluctuations in efficiency caused by human factors, ensuring stable operations and significantly improving overall throughput efficiency;

Operates 24 hours a day, 7 days a week:
Operations have overcome the constraints of manual warehouse hours and shifts, enabling continuous, stable order fulfilment without interruption, even during peak periods.

Cost control

Maximising vertical space:
Operating in narrow aisles, with a high-density layout and 4-metre-high stacking, this solution increases the number of SKUs per unit area several-fold, thereby reducing costs per square metre;

Flexible deployment and elastic scaling:
The number of robots and shelving units can be flexibly adjusted in line with business growth, enabling investment on demand and avoiding inflexible expenditure;

Significantly optimise the workforce structure:
By eliminating repetitive walking and picking tasks, staff can focus on higher-value activities, thereby reducing reliance on large-scale labour.

intelligent

Smart Promotional Forecasting:
Use AI predictions to pre-adjust the placement of best-selling items, thereby shortening picking routes;

Real-time automatic restocking:
Automatically generate restocking tasks and trigger alerts when stock levels fall below a threshold, thereby reducing stock wastage;

Data-driven optimisation:
Analyses data on ‘top-selling items, efficiency bottlenecks and slow-moving stock’, and continuously generates automated recommendations for optimisation.

Proposal for the Establishment and Operation of the Embodied Intelligence Innovation Centre

Zerith's end-to-end data management solution integrates multi-modal data acquisition devices, an intelligent data management platform and an efficient model training and inference toolchain to build a centralised data hub that combines data acquisition, processing, training and application. It helps enterprises overcome data bottlenecks, accelerate the development of AI applications and enhance their overall level of intelligence.

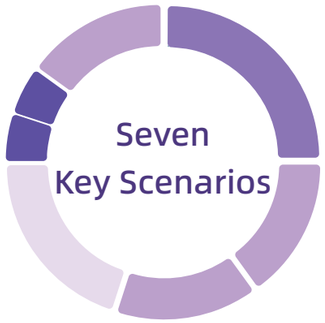


Zerith Data Collection Centre

Real-life scenarios
100+

Items
Over 3,000

Long-sequence tasks
80%





Business scenarios 15%



Hotel cleaning 15%



Catering 15%



Industry 15%



Office 15%



Instant retail 25%



Household 20%

Multimodal information

- Visual Information
- Joint Information
- Space Information
- Force Feedback Information
- Semantics Information

Data Centre Customer Case Studies

Key pain points

- Missing data modalities
- Data collection is a tedious process
- High costs of data management
- High barriers to training and deployment

End-to-end data management solution

1. **Data Collection Task Management**
   Quickly create, distribute and approve data collection tasks
   Supports batch operations
2. **Data collection**
   Supports mainstream data acquisition methods for VR remote control
3. **Data validation and annotation**
   Supports adding custom labels to tasks and data
   For quick filtering and retrieval
4. **Data licensing**
   RBAC-based role management and access control
   Efficient implementation of data authorisation
5. **Version and Property Management**
   To implement standardised version and attribute management for collected data
   To facilitate auditing and control
6. **Data Asset Deactivation**
   Standardised data deactivation process
   Supports both physical and logical deletion of collected data

Client Case Studies

Sichuan Province







Yangtze River Delta







Hefei







Zerith





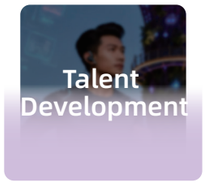


Higher Education Solutions

Against the backdrop of national strategy, industrial needs and educational reform, Zerith has established an embodied intelligence education ecosystem characterised by the synergistic operation of ‘research and education, talent development, practical training centres and data acquisition centres’.

Four major sections









Research and Education

Leveraging Tsinghua University’s cutting-edge technological expertise, we provide a fully integrated, in-house developed hardware and software platform to help universities nurture the next generation of AI developers.

- **Fully in-house developed platform:**
  Features a full-body remote control system (millisecond-level synchronisation)
  Bionic dual arms with an exceptionally wide range of motion
  and multimodal sensing capabilities, ready to use straight out of the box

- **Closed-loop software platform:**
  Provides a software platform that integrates ‘data collection, algorithm validation and R&D’
  Supports mainstream simulation environments to enable one-stop embodied data management

- **An open research ecosystem:**
  Fully open SDK and low-level APIs
  Equipped with the Zerith-V0 embodied action large language model, supporting rapid algorithm validation in laboratories to assist with research projects



Talent development

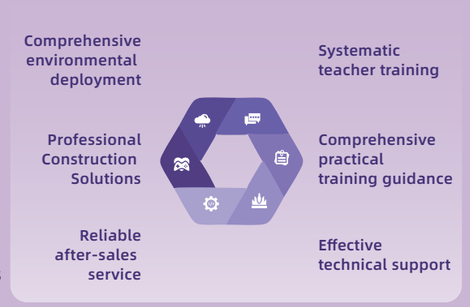
We are building a talent ecosystem comprising ‘three centres and one platform’, with a role-based approach that covers a comprehensive talent development system spanning all levels from vocational to undergraduate education.

Job-oriented system:
A comprehensive practical training curriculum
Tailored to meet the specific requirements of AI-related roles
Customised, differentiated skill development pathways

Industry-education integration model:
A collaborative teaching model developed through university-industry partnerships
Ensuring a close alignment between the content of specialist courses and professional standards

Building composite capabilities:
Focus on developing an understanding of technical principles and engineering implementation
Innovative application and coordination skills
Progressive skill development through practical training courses

Full lifecycle service support



Training Centre

Establish an integrated training centre combining ‘technology outreach, course-based training and industry practice’, bringing real-world industry scenarios onto campus so that students can complete the full cycle of ‘mastering, applying and innovating’ within an authentic embodied intelligence industry environment.

Scenario-based practical training layout
Teaching and Practice Centres, Industry Application Centres and Research and Innovation Centres have been established to meet the diverse needs of teaching, production and research.

Real-life scenario drills
Through the integrated development of teaching and practical training, research into skills training, and project incubation, we aim to cultivate multi-skilled professionals capable of deploying, maintaining and developing applications in industrial and commercial settings.

Collaboration and mutual benefit between universities and industry
The company provides equipment and technical support, whilst the school provides the premises and teaching staff, thereby achieving an ‘integration of teaching, learning and practice’ alongside corporate-style management and operations.

Teaching Practice Centre



Assembly and Operations Centre
Full-Unit Assembly and Disassembly Training Room
Full-Unit Debugging Training Room.



Data Training Ground
Data Collection and Annotation Training Lab
Data Training Lab



Industrial Applications Centre
Business Applications Training Lab
Logistics Applications Training Lab
Industrial Applications Training Lab

To the teacher

Upgrading technical capabilities:
Participating in industrial technology upgrades and the development of practical applications.

Extending teaching resources:
Leveraging real-world industrial scenarios to achieve an ‘integrated approach to teaching, learning and practice’and enriching teaching content and methods.

For students

Skills Development:
Through practical training in real-world scenarios, students will master specialist skills such as data collection and functional testing;

Career Pathways:
Leveraging industry-academia collaboration resources, students will gain access to high-quality internship and employment opportunities, thereby completing the ‘master-apply-innovate’ competency cycle.

Data Acquisition Centre

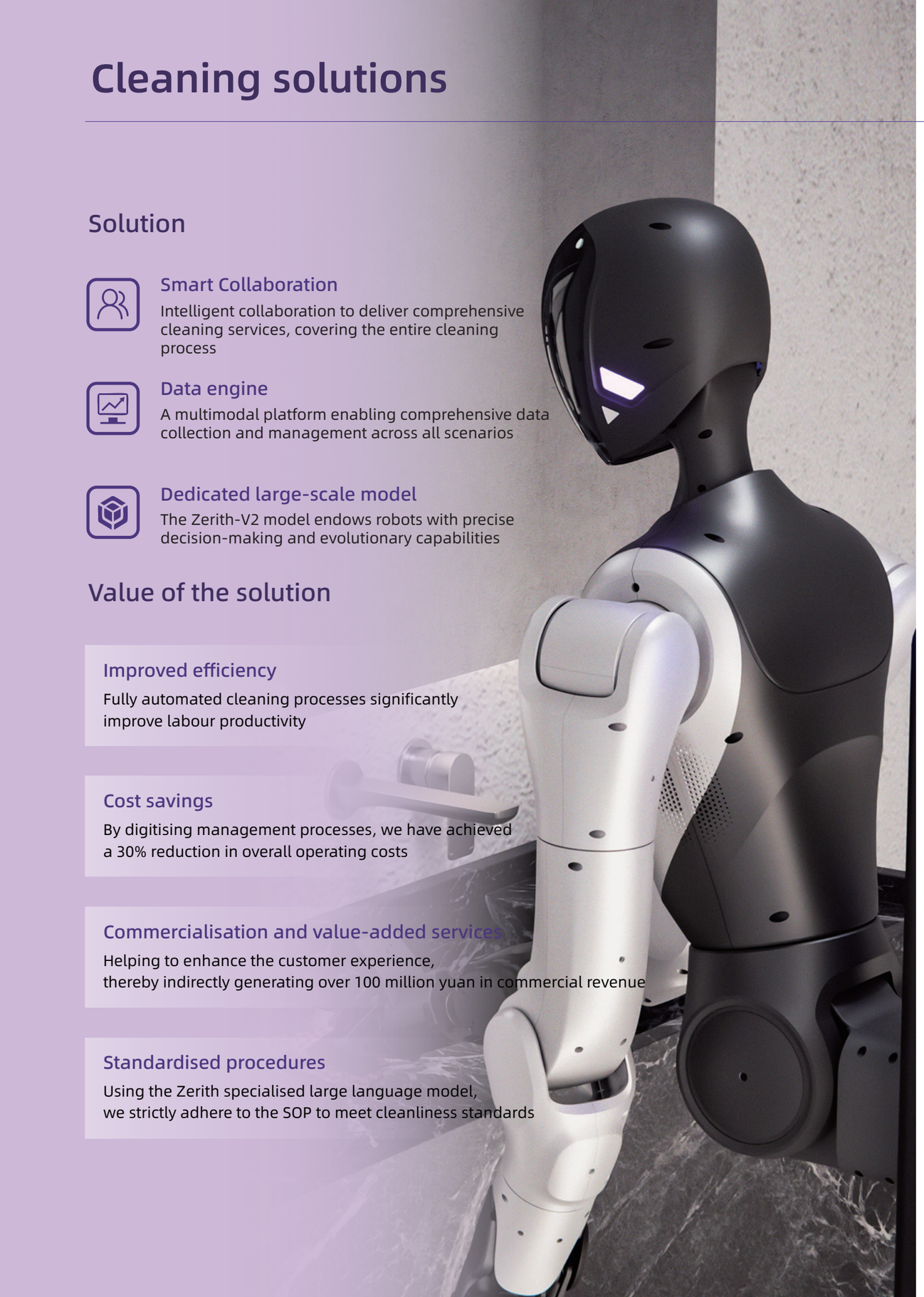
Building on a foundation of ‘data, platforms and models’, we are establishing a data acquisition centre that covers the entire process–from real-world data collection and data management to model training–to provide ‘real-world data’ support for industry and education.

End-to-end closed-loop
Establish a comprehensive toolchain comprising ‘data collection process definition–standard teaching–batch data collection–quality cleaning–simulation training–deployment optimisation’

Scenario incubation capabilities
Based on the ‘1+X+N’ model (1 hub + X specific scenarios + N industry applications), we incubate real-world industrial scenarios across sectors such as manufacturing, commerce, healthcare and the home

Translation of commercial value
Students are directly involved in real-world data collection and annotation projects for businesses, thereby reducing costs for companies and enhancing students’ practical experience, resulting in a win-win situation for both the university and industry.

Cleaning solutions



Solution

Smart Collaboration

Intelligent collaboration to deliver comprehensive cleaning services, covering the entire cleaning process

Data engine

A multimodal platform enabling comprehensive data collection and management across all scenarios

Dedicated large-scale model

The Zerith-V2 model endows robots with precise decision-making and evolutionary capabilities

Value of the solution

Improved efficiency

Fully automated cleaning processes significantly improve labour productivity

Cost savings

By digitising management processes, we have achieved a 30% reduction in overall operating costs

Commercialisation and value-added services

Helping to enhance the customer experience, thereby indirectly generating over 100 million yuan in commercial revenue

Standardised procedures

Using the Zerith specialised large language model, we strictly adhere to the SOP to meet cleanliness standards

Client partners

AI computing

intel · NVIDIA · Lenovo 联想

computing power

百度云 · 腾讯云 · 金山云 · 火山引擎

Manufacturers & Key Components

蓝思科技 · LINKHOU · 长盈精密 · SwanLab · Kinco 步科

University-industry partners

清華大學 Tsinghua University · 北京大学 · 西安电子科技大学 XIDIAN UNIVERSITY · 香港大學 THE UNIVERSITY OF HONG KONG

UNIVERSITY OF MICHIGAN · MIT · 香港科技大學 THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY · Berkeley

中国科学技术大学 University of Science and Technology of China · 哈尔滨工业大学 HARBIN INSTITUTE OF TECHNOLOGY · 创新无限 创业无疆 · 中山大学 SUN YAT-SEN UNIVERSITY

重庆理工大学 · 合肥工业大学 · 南昌理工学院 NANCHANG INSTITUTE OF TECHNOLOGY · 广西理工职业技术学院 Guangxi Vocational Institute of Technology

广东亚视演艺职业学院 GUANGDONG ATV COLLEGE OF PERFORMING ARTS · 延安大学西安创新学院 · 郑州航空工业管理学院 ZHENGZHOU UNIVERSITY OF AERONAUTICS

HUAWEI · 中国人工智能产业发展联盟 Artificial Intelligence Industry Alliance · 科大讯飞 iFLYTEK · 数碼港 Cyberport