UBTECH EDUCATION
优必选教育

Dream with Robots

Embodied Intelligence Walker Tienkung Humanoid Robot Research Platform

UBTECH
2025

"Walker E" robot wins
the championship!
-Setting a world record!-

Walker Tienkung Humanoid robot parameters

UBTECH EDUCATION 优必选教育

Full-Size Humanoid Robot for Research & Education

Model		Walker Tienkung (vision and voice)	Walker Tienkung (Embodied intelligence)
Capability		Voice & Vision Interaction Expansion Kit	Embodied Intelligence Manipulation Expansion Kit
Functions		Dancing, waving, walking on flat ground, walking on slopes, voice dialogue	Dancing, waving, walking on flat ground, walking on slopes, voice dialogue, dexterous hand movements
Research Direction Features		Motion control Embodied interaction Embodied navigation (Motion GPT, VSLAM, VLN, etc.)	Motion control Embodied interaction Embodied navigation Embodied operation (VLA, Task Planning, etc.)
Main Parameters	Degrees of freedom (DOF)	21 full - body degrees of freedom	42 full - body degrees of freedom
	Sensors	IMU、RGBD*3	IMU, RGBD3, two 6-dimensional forces
	Joint module	High - performance integrated joint	
	End effector	Model hand	Two 6-DOF dexterous hands
	Interaction device	AI voice module	AI voice module
	computing platform	I7-1355U、Orin AGX 64*1	I7-1355U、Orin AGX 64*2
	Battery capacity	30Ah+3Ah	
	Optional	LiDAR	LiDAR

Core Advantages

Full-Size & High-Performance Humanoid Robot

- **Anthropomorphic Design:** 172cm height, 42 DOF configuration, supports 10km/h sprinting and complex movements
- **Lightweight Structure:** Proprietary integrated joint modules, 300Nm peak torque, aerospace-grade aluminum + titanium alloy construction
- **Dual-Battery Thermal Management:** 30Ah+3Ah hot-swappable batteries, full-body air duct cooling
- **Work smarter, not hotter:** 3-hour continuous motion, 8-hour non-stop performance

Modular Design with High scalability

- Body Expansion: 7-DOF collaborative arms, 6-DOF dexterous hands, 3-DOF head module
- Perception & Computing: Depth cameras, AI voice kit, six-axis force sensors, 550 TOPS Orin computing board
- Application Scenarios: University Research, Commercial services, complex terrain navigation, industrial logistics, healthcare, home assistance, power inspection

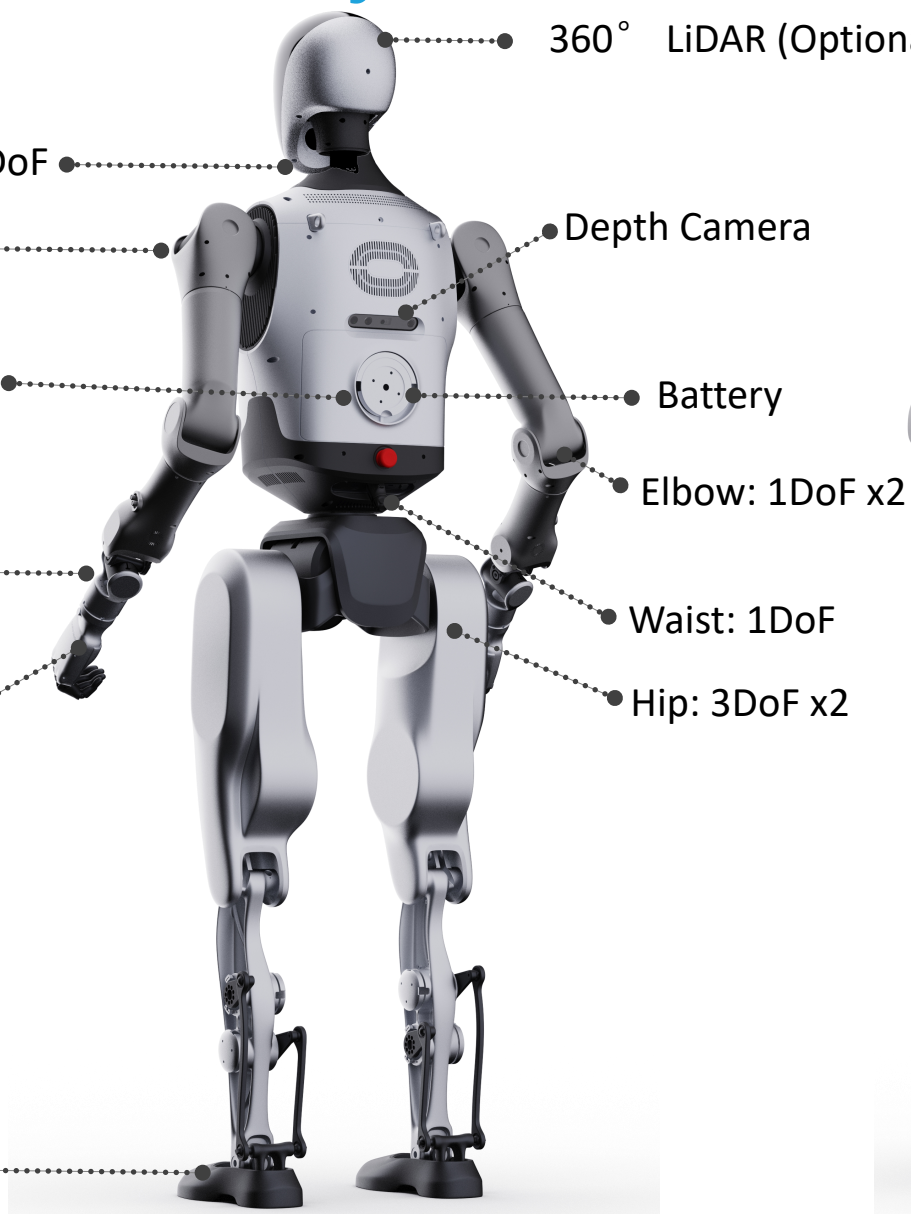
Open-Source Ecosystem

- One-Stop Development: High-precision URDF models, open-source training frameworks, and access to the "Kaiwu" platform (robot trajectory data, scene skills, open OS) for fast application development.
- Guides & Code: Ready-to-use development manuals and sample code for secondary development in embodied intelligence and motion control.

Product Introduction-Body Structure

优必选 UBTECH | Education

Walker Tienkung(Embodied intelligence)



360° LiDAR (Optional)

Neck: 3 DoF

Shoulders: 2x 3 DoF

Depth Camera

550 TOPS Computing Module

Battery

Elbow: 1DoF x2

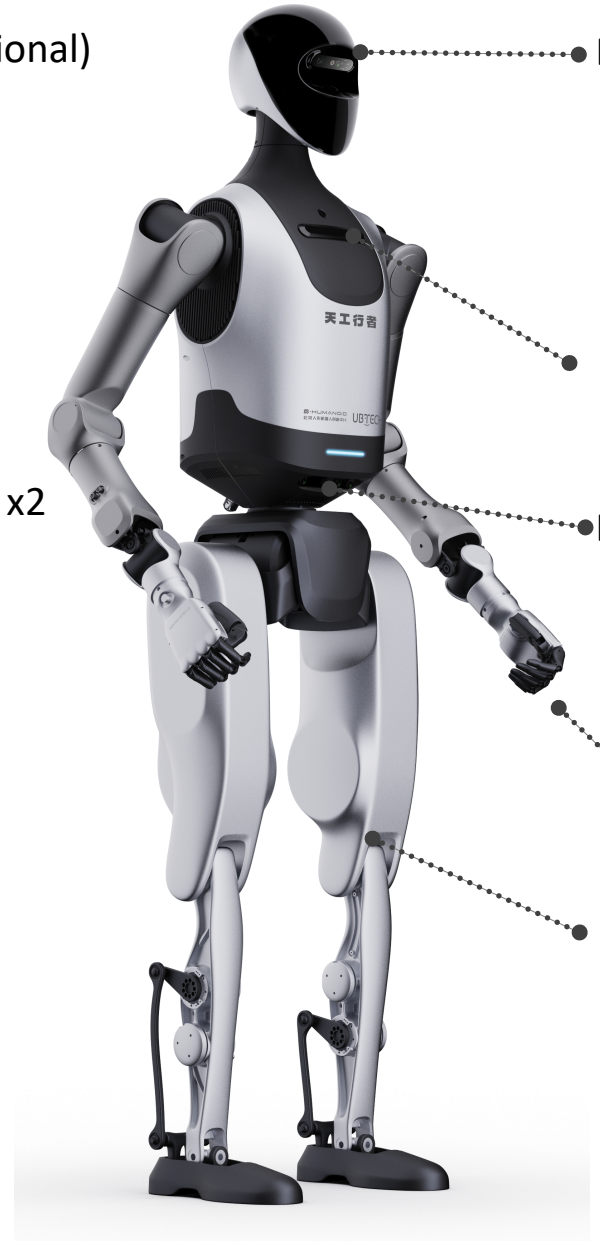
Wrist: 3DoF x2

Waist: 1DoF

Hip: 3DoF x2

Wrist 6-dimensional forces x2

Ankle: 2DoF x2



Depth Camera

4 MIC Array

Depth Camera

2x 6 DoF dexterous hands

Knee: 1DoF x2

Standard Delivery: Robot Body, Power Adapter, Remote Control, Manual, SDK Documentation

Open-Source Resources

优必选 UBTECH | Education

SDK Software Development Kit

Application Interface

Open Platform

ROS

Hardware Interface

Vector Walking

Arm Trajectory Planning

Whole Body Control

MLLMs

Neural TTS

Neural ASR

Embodied Operation

Embodied Navigation

IMU

Joint Motor

Depth Camera

6D Force

Dexterous Hand Control

Audio Input

Audio Output

LiDAR

For Development

Basic Example

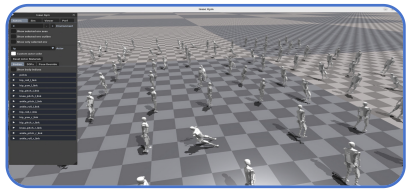
Reinforcement Learning Example

Imitation Learning Example

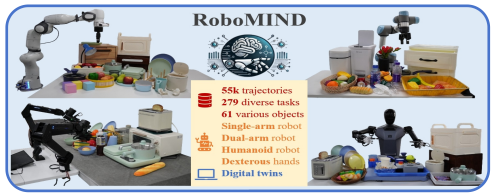
.....

Support

High - Precision URDF



Open Source Dataset



Isaac Sim

NVIDIA

MuJoCo

MuJoCo

Advanced physics simulation

Webots

Webots

robot simulation

Data Collection Training Center

UBTECH EDUCATION 优必选教育

Product Introduction - Interface List

UBTECH 优必选 | Education

Category	Interface Name	Interface Content
Basic Interface	IMU Status Acquisition Interface	Acquires IMU sensor data, including acceleration, angular velocity, pose quaternion and Euler angles
	Head Motor Status Acquisition Interface	Acquires the status information of the head motor, including the current position, speed, current and temperature of the motor
	Head Motor Control Interface	Position control interface for the head motor, requiring desired position, desired speed, maximum current
	Waist Motor Status Acquisition Interface	Acquires the status information of the waist motor, including the current position, speed, current and temperature of the motor
	Waist Motor Control Interface	Position control interface for the waist motor, requiring desired position, desired speed, maximum current
	Leg and Arm Motor Status Acquisition Interface	Acquires the status information of the leg motor, including the current position, speed, current and temperature of the motor
	Leg and Arm Motor Control Interface	Supports three motor control modes: force - position hybrid control, speed control, position control. Requires kp, kd, desired position, maximum current and feedforward torque
	Dexterous Hand Status Acquisition Interface	Acquires the actual angle of the hand fingers. The response value represents the joint angle, with a range of 0 to 1, where 0 indicates fully bent and 1 indicates fully extended
	Dexterous Hand Control Interface	Sets the angle, torque, and actual speed of the hand claw
	6-dimensional forces Status Acquisition Interface	Acquires torque information in different directions of the 6-dimensional forces. The reporting frequency is 200Hz
	Depth Camera Interface	Depth camera status information
	ASR Interface	Speech - to - Text
	TTS Interface	Text - to - Speech
	Video Stream Service Interface	Provides the visual data of the body, image and video stream, which can interface with apps
	Device Status Interface	Supports viewing battery information, device operation duration and other information
High level Interface	Motion Control Interface	Includes robot motion mode setting and walking direction speed setting
	Arm Control Interface	Given the target pose of the end - effector, outputs the arm movement trajectory
	Action Interface	Contains encapsulated actions, waving, punching, shaking hands, bowing, dancing
	Visual Navigation Interface	Supports navigation path generation and motion control based on the target position

Walker Tienkung Research direction

Directions of Humanoid robot co-research and co-creation

UBTECH EDUCATION 优必选教育

Frontier research topics

Brain

- Embodied Intelligence Technology
- Large Model Voice Interaction
- Large Model Training Database
- Robot Emotional Intelligence
- Humanoid Motion Expression
- Cloud-edge-terminal Collaboration
- Collective Intelligence
- .....

Cerebellum

- Robot Balance Control
- Hand-eye Coordination Technology
- Compliance Control
- Whole-body Coordination Control
- High-dynamic Motion Control
- Robotic Dexterous Manipulation Technology
- Local Obstacle Avoidance
- .....

Physical Platform

- Vision-tactile Sensors
- Flexible Electronic Skin
- Rotary Integrated Joint Module
- Linear Integrated Joint Module
- Reducer Technology
- Motor Technology
- High Precision IMU
- .....

Generalized application scenarios

Flexible Manufacturing

Logistics and Delivery

Special Operations

Supermarket Customer Reception

More Scenarios

Walker Tienkung Application Scenarios

High-level humanoid robot application scenario and research direction

UBTECH EDUCATION 优必选教育

Laboratory scene planning and space design

Complex Ground Scene Package		Industrial	Commercial	Home Service	Teleoperation Data Collection Training Lab
Irregular Sand	Rocky	Special Inspection	Supermarket Checkout	Home Service	
Soft Grass	Anthropomorphic Running	Precision Operation	Supermarket Item-picking	Home Service	
Stairs	Soft Sand	Industrial Sorting	Supermarket item retrieval	Home Service	Teleoperation

Walker Tienkung Application Scenarios

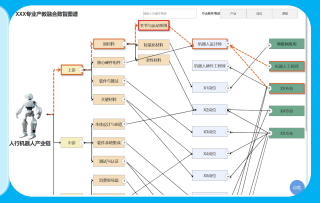
Teaching Practice and Application Innovation

UBTECH EDUCATION 优必选教育

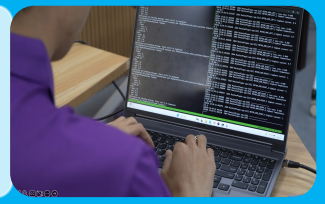
Talent Cultivation

Open API, with the robot’ s strong computing unit, applies tech like embodied intelligence to perception, decision making, and control. It does practical teaching, data collection, training (teacher, etc.) to foster embodied - intelligence talents.

university
Embodied intelligence
course resources



vocational school
Embodied intelligence
Data Collection course
resources



Embodied intelligence
Teacher
Training

Innovation Exploration

Based on anthropomorphic look, flexible movement, speech - vision modules, precise hand control, and multi - sensor features, explore application innovation in commercial, data collection, industrial logistics, and medical health scenarios.

Commercial
Exhibition

Data
Collection

Smart Education

Industrial
Application

Cooperation

Humanoid Robot Co-Research and Co-Creation

UBTECH EDUCATION 优必选教育

General Embodied Intelligence Innovation & Education Center

University-Enterprise Partnership Growth Plan

Step 1:Construction

Construction of joint laboratories and Innovative talent training bases

- Construction of embodied intelligence research and joint laboratory
- Construction of innovative talent training center
- Construction of dataset sharing center

Step 2: Growth

formulate standards to accelerate the process of technology commercialization and industrialization.

- Co-establish research topics
- Co-establish humanoid robot industry and talent standards
- Share an open humanoid robot evaluation test center

Step 3: Leading

Leading scientific research and industrial applications, leading the industry's technological progress

- National research project
- Technology innovation and application results transformation
- Investment and financing ecosystem construction

Create a high-level industry-university-research exchange and activity platform

Technical consulting services	Industry-University-Research Exchange Activities	Achievement display and transformation services
➢ Open source community and technical consultation ➢ Investigation and exchange ➢ Training activities (teachers/students) ➢ “Co-research and co-creation of humanoid robots” open day	➢ Quarterly seminar salon ➢ Professional academic forum	➢ Embodied Intelligent Robot Club ➢ "Internet+" College Students Innovation and Entrepreneurship Competition ➢ Major Industry Summits and Exhibitions ➢ Capital Matchmaking

Cooperation

Building a Leading Embodied Intelligence Open Source Community

- Partner with universities, research institutes, and integrators to create the leading open-source community for embodied intelligenc

Open-source hardware

Open-source equipment design documents (structural diagrams, complete system, software architecture, etc.)

Open-source second-generation structural design, complete system, and software architecture

Open-source Dataset

Launch the platform, implement 3 scenario demos on the Walker Tienkung robot, and open-source 10,000 general-purpose datasets.

Open-source partial Agent and skill libraries, along with 300,000 general-purpose datasets.

Open-source Operation and Control

Release the huamanoid robot motion control SDK.

Open-source the humanoid robot motion control training framework.
Release the mobile teleoperation control system.

Lead top national companies to create an embodied intelligence dataset industry.

Develop embodied intelligence dataset operations.

Provide data model training algorithms.

Open Source Community.

Enable the application of embodied intelligence robots.

Cooperation

UBTECH EDUCATION 优必选教育

Accelerating the Commercialization and Industrialization of Technology

Jointly establishing standards for the humanoid robotics industry and talent.

Centering on embodied intelligent robots, we are jointly establishing industry and talent standards. Our approach is guided by industry needs and aims for widespread standard adoption. We prioritize group standards while simultaneously advancing national and international standards.

- Participating in the formulation of international standards,
- Spearheading the development of national standards
- Spearheading the drafting of alliance group standards.

Planned standard development:

"AI Embodied Intelligence Data Collection Specification" - Initiation, Group Standard + Industry Standard

"Intelligent Grading of Humanoid Robots" - Draft

Establish Humanoid Robot Evaluation Center

Establishing a humanoid robot evaluation center open to universities and research institutions, providing robot testing and certification services.

- Intelligent Evaluation Laboratory (Evaluating the intelligence level of robotic products, with three labs already established: intelligent perception, cognitive decision-making, and interaction.)
- Electromagnetic Compatibility Laboratory

Intelligent Perception Cognitive Decision-Interaction

Cooperation

UBTECH EDUCATION 优必选教育

Driving industry technological advancement and demonstrating application scenarios

National-level key technology research topics.

Collaboratively Tackling Key Common Technological Challenges.

- Undertaking major national strategic tasks to address critical national needs.
- Mobilizing national resources to achieve industrial autonomy and control.
- Industrial collaborative innovation, issuing challenges to tackle technical difficulties.
- Leading the publication of guidelines.
- Lead the writing of industry research reports.

Achievement Transformation of technological innovation and scenario application

- Promote the transformation of academician project
- Promote the transformation of other embodied intelligence-related technologies.

Support with upstream and downstream enterprises in the industry chain, demonstrating applications in equipment manufacturing, environmental protection, and 3C fields.

Industry-academia-research collaboration.	Industrial manufacturing	Buisness	Specialized operation	Dangerous Scenarios	Government Support
UBTECH ROBOTICS CORP. LTD	ZTE factory material sorting	"Tianyi"	Electricity Inspection	Chemical operations	Donggang Ruihong

Entrepreneurship development

Coaching
- Innovation Mentor
- Entrepreneurship Mentor

Support
- Research Support
- Industry Collaboration

Capital
- Venture Capital
- Industrial Capital

Communication
- Brand building
- Events and Competitions

UBTECH EDUCATION 优必选教育

Special project on humanoid robot industry and talent standards

Embodied Intelligence Humanoid Robotics Standards Leader

- Deputy leader of the Humanoid Robot and Embodied Intelligence Standards Working Groups, contributing to nearly 40 national and industry standards.
- Focused on robot performance, data assurance, and system collaboration.
- Leading standards in environmental perception, decision-making, operation, motion control, component interfaces, and testing.

National Standards

Industry Standards

Talent standards

List of some industries and talent standards

- China's First National Standards for Humanoid Robots:
  Lead Developer of "Technical Requirements for Humanoid Robots: Motion Control"
- Industry Standards:
  Lead Developer of "Data Collection Specifications for Embodied AI"
- Group Standards:
  Lead Developer of "Test Methods for Accuracy and Stability of Humanoid Robots"
- Talent Standards:
  "Specialized Professional Competency for Teleoperation Data Collection in Embodied Intelligence"

UBTECH EDUCATION 优必选教育

Numerous Universities Join the Co-Research & Co-Creation Initiative, Conducting Scientific Research and Applications

FUDAN UNIVERSITY 1905 復旦大學

SHANGHAI JIAO TONG UNIVERSITY 1896 上海交通大學 SHANGHAI JIAO TONG UNIVERSITY

WUHAN UNIVERSITY 1893 武漢大學 WUHAN UNIVERSITY

北京航空航天大學 BEIHANG UNIVERSITY

TIANJIN UNIVERSITY (PEIYANG UNIVERSITY) 1895 天津大學 TIANJIN UNIVERSITY

南京理工大學 NANJING UNIVERSITY OF SCIENCE & TECHNOLOGY

SHENZHEN UNIVERSITY 1983 深圳大學 SHENZHEN UNIVERSITY

江漢大學 JIANGHAN UNIVERSITY

TUTE 天津職業技術師範大學 Tianjin University of Technology and Education

Cooperation

UBTECH EDUCATION 优必选教育

Peking University

Emotional intelligence application

Peking University co - builds the lab with the National - Local Co - constructed Embodied Intelligence Robot Innovation Center. Focused on applying affective intelligence tech to humanoid robots, it combines ACIR's algorithm edges with the center's hardware strengths, realizing emotional, smart, personalized robot apps for better human service.

“国家地方共建具身智能机器人创新中心”在2024世界机器人大会上首发的具身智能服务机器人“天轶”
搭载ACIR实验室的情感与认知模型及算法，使其能够“识别人类情感与情绪，进行更深层次的智能交互”

Jianghan University

Smart healthcare application

Jianghan University, a Hubei first - class discipline - building uni, partners with UBTECH's School of Intelligent Manufacturing to cultivate "New Engineering" talents via intelligent - robot talent cards. Cooperation: Leveraging provincial - key - lab and robot - research bases, research humanoid robot algorithms and merge humanoid tech with affiliated hospital medical - rehab scenes.

Tianjin Vocational University

Smart Health Care application

Tianjin Vocational University. collaborates with UBTECH on humanoid robots, establishing a college with "Humanoid & Intelligent Robot Education" to explore health - care robot apps and nurture industrial - talent & robot teachers. Cooperation: Use brain - machine - interface & intelligent - robot research bases for humanoid robot algorithm - application study, explore smart health - care scenarios, and train data - collection talent.

Dream with Robots