



Product Overview

The AI Vision Humanoid Robot Training System is an advanced educational humanoid platform designed for learning **Robot Operating System (ROS), Artificial Intelligence, Computer Vision, Python Programming, Motion Control, Robotics and Autonomous Navigation**. Built on a Raspberry Pi computing platform, the robot combines AI vision, inverse kinematics, intelligent servo control and ROS-based software development to provide a complete learning and research environment.

The robot supports walking, turning, obstacle crossing, stair climbing, object manipulation, autonomous navigation and AI vision applications, making it suitable for universities, engineering institutes, research laboratories and robotics training centers.

Key Features

- ROS (Robot Operating System) based architecture
- Raspberry Pi powered embedded controller
- Up to **24 Degrees of Freedom (DOF)**
- High-strength aluminium alloy body
- Self-balancing inverse kinematics
- AI vision with HD wide-angle camera
- OpenCV based image processing
- Python programming support
- Complete ROS source code
- Gazebo simulation support
- Graphical motion editing software
- Intelligent serial bus servos
- Magnetic encoder hip joints

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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- Robotic grippers with anti-block protection
- Adjustable walking speed, turning radius and body posture
- Android & iOS App support
- Suitable for AI and robotics education

Mechanical System

Structure

- Aluminium alloy lightweight body
- Humanoid bionic design
- Up to **24 Degrees of Freedom**
- Orthogonal X-Y-Z coincident joint arrangement
- Dual hip joint mechanism
- High flexibility for natural walking and turning

Motion Capability

- Stable walking
- Autonomous turning
- Stair climbing
- Hurdle crossing
- Low-clearance passage movement
- Ball kicking/shooting
- Object grasping
- Object transportation
- Flexible arm manipulation

AI Vision System

Camera

- 2-DOF Pan-Tilt Camera
- 120° HD Wide Angle Lens
- 1 Megapixel Resolution
- Manual Focus

Vision Functions

- OpenCV image processing
- Target recognition

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- Object localization
- Color tracking
- Face detection
- Line following
- Intelligent picking
- Sorting applications
- Target tracking

Embedded Controller

- Raspberry Pi Controller
- Broadcom Quad-Core Cortex-A72 Processor
- 32 GB MicroSD Storage
- ROS Operating System
- Python Programming Environment

Servo System

Intelligent High Voltage Serial Bus Servos featuring:

- Position feedback
- Voltage feedback
- Temperature feedback
- Magnetic encoder servos on hip joints
- High positioning accuracy
- Overload protection
- Anti-block protection for robotic hands

Sensor System

IMU

- 3-Axis Gyroscope
- 3-Axis Accelerometer
- 3-Axis Compass

Provides robot posture estimation and balance control.

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Software Environment

Supported Platforms

- Robot Operating System (ROS)
- Python Programming
- OpenCV
- Gazebo Simulation
- Visual Action Editing Software

Development Support

- Complete ROS source code
- Simulation models
- Secondary development support
- Motion programming
- Graphical action editor
- Drag-and-drop servo programming
- PC-based motion debugging

Communication

- Android Application Support
- iOS Application Support
- PC Programming Interface
- ROS Communication Framework

Power System

- Rechargeable Li-Po Battery
- Battery Rating: **11.1 V, 3500 mAh, 5C**
- Integrated voltage monitoring module

Technical Specifications

Parameter	Specification
Robot Type	AI Vision Educational Humanoid Robot
Degrees of Freedom	Up to 24 DOF
Body Material	Aluminium Alloy
Product Dimensions	193 × 135 × 415 mm
Weight	Approx. 2.45 kg

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Parameter	Specification
Walking Speed	21 cm/s
Camera	120° HD Wide Angle, 1 MP
Camera Motion	2 DOF
Processor	Broadcom Quad-Core Cortex-A72
Controller	Raspberry Pi
Storage	32 GB MicroSD
Operating System	ROS
Programming Language	Python
Wireless App	Android / iOS
Motion Editor	Visual PC Software
IMU	3-Axis Gyroscope, Accelerometer & Compass
Battery	11.1 V, 3500 mAh Li-Po
Joint Feedback	Position, Voltage & Temperature

Educational Experiments

- ROS Fundamentals
- Python Programming
- Robot Kinematics
- Inverse Kinematics
- Computer Vision
- OpenCV Programming
- AI Object Detection
- Color Recognition
- Face Detection
- Line Following Robot
- Autonomous Navigation
- Motion Planning
- Servo Programming
- Robot Balance Control
- Robot Gait Generation
- Simulation using Gazebo
- Robot Manipulation
- Pick and Place Applications

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