WHITE BOX ROBOTICS™

Dream in White

914 PC-BOT

Robotics Development Platform

Linux version

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Robotics Development Platform - Linux version

914 PC-BOT Exclusive Offer

This high quality, research and development platform for PC-based, open architecture robot is available on a special, limited time basis.

White Box Robotics is committed to building a new, highly innovative class of robots that leverages the universal and open standards of the PC to build low-cost, highly flexible robotic applications.

This PC-BOT will fuel a new wave of exciting robotics research and development that enables and encourages everyone to participate.

- Open standards PC-based platform provides common baseline for research, peer review and code-sharing.
- Well known and documented “white box” PC architecture
- Industry standard interfaces (USB, Serial, IEEE1394)
- Thousands of inexpensive, off-the-shelf parts.
- Driver support for Linux or Windows
- PC price and reliability
- Ideal baseline platform for robot education and competitions

Physical Specifications*

- Height: 53.4 cm Weight: 25 kg
- Payload: Up to 5 kg
- Maximum Climb Slope: 8 degrees
- Differential drive train with independent front suspension, patented self-cleaning roller ball casters and 2 DC stepper motors
- Torso unit containing: 2 foldable side bays (power supply housing/ bay 1, main system board/ bay 2), 8 x 5.25" bays (5 available to user, 1 used for sensors, 1 used for 5.25” speaker and 1 used for Slim DVD/CD-ROM and SATA HDD).
- USB Machine Management Module (M3) - motor controller and I/O board interface
- One I/O board with 8 analog inputs for IR or other sensors, 8 digital outputs, 8 digital inputs and 2 USB ports sourced from the Mini-ITX.
- Two M2-ATX power supplies with automatic battery monitoring and auto-shutoff
- Head assembly containing one web camera.
- Sensor array containing: 8 fixed and factory installed IR sensors (5 sensors installed in bumper and 3 sensors installedin 5.25" bay). Injection moulded plastic body panels
- VIA EPIA SP13000 LVDS Mini-ITX Motherboard
- 1 Gbyte of RAM, PC3200 DDR 400MHz DIMM
- 80 GB 2.5" SATA Hard drive
- Slim-style DVD-ROM/CD-RW Combo Drive
- 5.25" computer bay speakers
- 2 x 12V 9Ah (45W) Lead Acid Battery
- SONEIL 12V Intelligent Battery Charger (3A) Universal INPUT
- 802.11g wireless USB adapter
- Linux UBUNTU Operating System and Player software.

*Specifications may change without notice.

High Quality Design and Engineering

Gone are the days of ‘One-Off’, low quality, unattractive, unreliable robotic research platforms. This robot has been designed with both beauty and functionality in mind. Internal hardware is fully enclosed for protection yet still easily accesible through fold down bays and quarter-turn fasterners. Body and head plastics pull off easily without requiring any tools by using ball sockets. The robot is assembled by skilled technical workers, passing in-depth quality control and assurance and completely tested before it leaves the facility.

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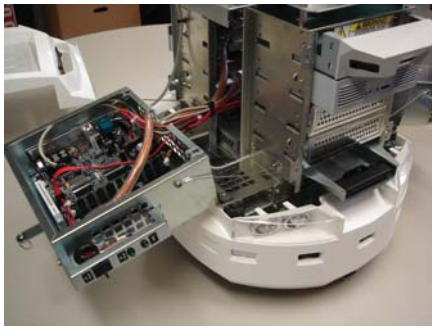
Expandable Hardware

As this robot is designed to follow PC architecture, modifications, improvements and upgrades can be done completely by a user with good PC skills. 5.25" bay accessories can be added, HDD and RAM size can be increased. Mini-ITX form factor boards will all fit within the computer bay allowing for a variety of inputs and outputs.



Need a Faster Processor?

A user can easily switch Intel based processors including DUO Core. Tested/proven motherboards can be recommended .

Need a Different Mini-ITX?

Due to the use of M2-ATX Power Supplies, the motherboard chosen must be one with 20 pin (or 20 pin compatible) ATX power connector and not require more than 100W to run.

* Some minor modifications may be required depending on processor/Mini-ITX chosen.

Need More I/O?

Add extra I/O boards through USB connectors such as:

Phidget Interface Kit
8 analog inputs,
8 digital inputs,
8 digital outputs,
and a 2 port USB hub.

Through extra I/O boards, more sensors could be added as well as long range analog ultrasonic sensors and environmental sensors.

Examples of other environmental sensors includes: humidity sensor, light sensor, magnetic sensor, pressure sensor, temperature sensor, vibration sensor and motion sensor.

Need Advanced Sensors?

Universities have already successfully integrated a laser scanner to give the robot even greater detection range.

Through USB or IEEE 1394 ports (optional), the robot can also use a variety of advanced cameras for visualization and vision processing applications and research

The above photo was taken at the university during an experiment on the cooperative navigation.

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Software Capabilities

Advanced Development Environment using Linux - Player/Stage Project

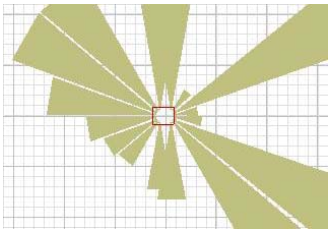
Open source Linux drivers to support platform mobility and basic navigation including obstacle avoidance have been integrated with Player/Stage and are available now at http://playerstage.sourceforge.net.

Player

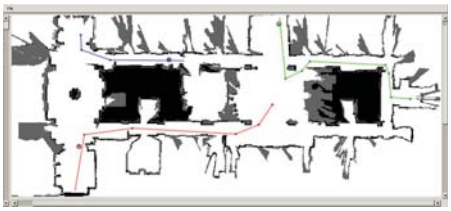
Player is a network server for robot control. Running on your robot, Player provides a clean and simple interface to the robot's sensors and actuators over the IP network. Your client program talks to Player over a TCP socket, reading data from sensors, writing commands to actuators, and configuring devices on the fly.

Included with Player:

Playerv - General-purpose sensor visualization and device control GUI.



Playercam - Camera visualization GUI.
Playerjoy - Joystick control for a mobile robot.
Playerprint - Print sensor data to the console.
Playernav - Multi-robot localization, navigation, and path-planning GUI.



Playervcv - Remote control of data logging and playback.
Playerwritemap - Retrieve map data and save it to a file.

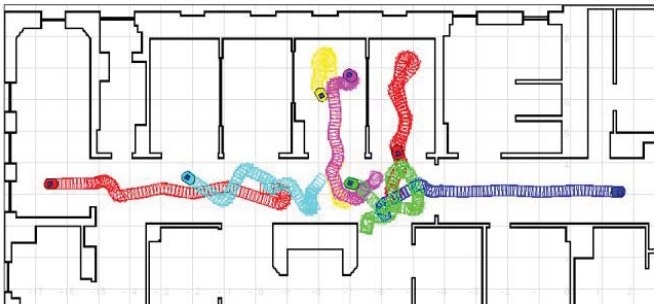
Ready for more advanced research? **Try Stage and Gazebo**

The Player/Stage project provides two multi-robot simulators: Stage and Gazebo. Since Stage and Gazebo are both Player-compatible, client programs written using one simulator can usually be run on the other with little or no modification. The key difference between these two simulators is that Stage is designed to simulate a small population with high fidelity. Thus, the two simulators are complimentary, and users may switch back and forth between them according to their needs.

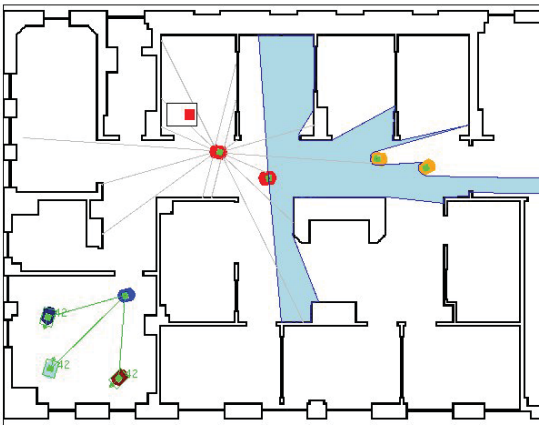
Stage

2D Multi-Robot Simulator

Stage simulates a population of mobile robots, sensors and objects in a two-dimensional bitmapped environment.



Stage is designed to support research into multi-agent autonomous systems, so it provides fairly simple, computationally cheap models of lots of devices rather than attempting to emulate any one device with great fidelity.



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Software Capabilities

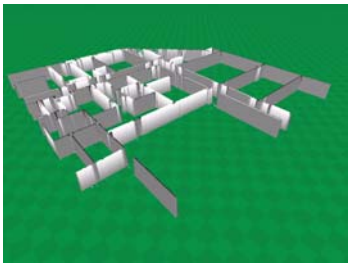
Gazebo

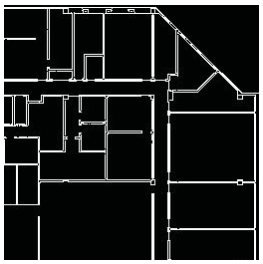
3D Multi-Robot Simulator

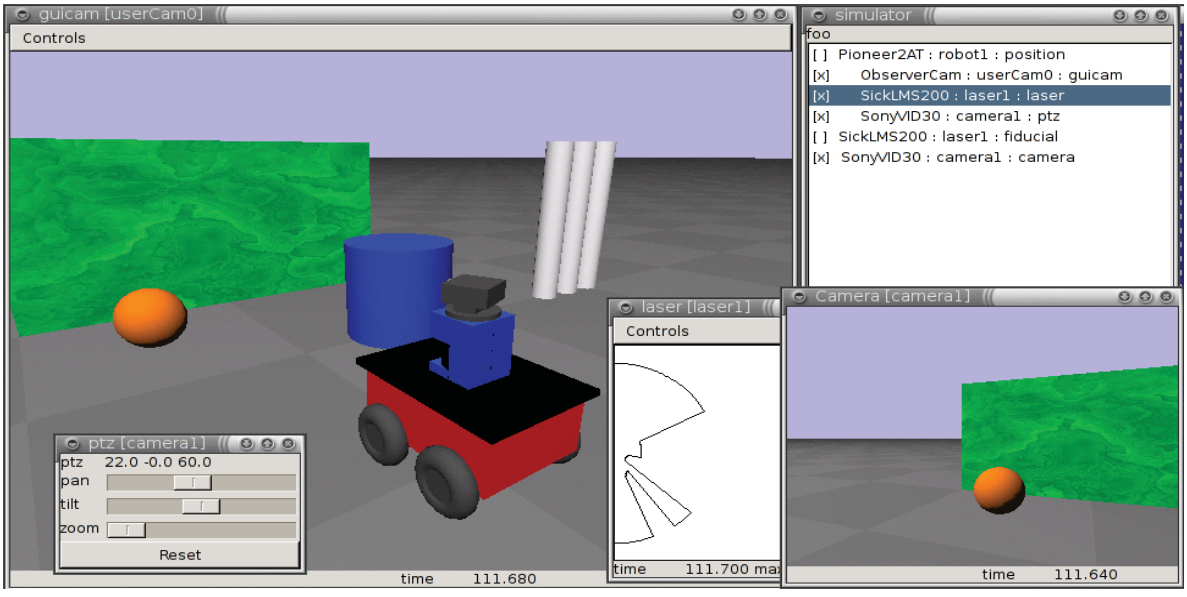
Gazebo is a multi-robot simulator for outdoor environments. Like Stage, it is capable of simulating a population of robots, sensors and objects, but does so in a three dimensional world. It generates both realistic sensor feedback and physically plausible interactions between objects (it includes an accurate simulation of rigid-body physics).

Features:

- Simulation of standard robot sensors, including sonar, scanning laser range-finders, GPS and IMU, monocular and stereo cameras.
- Models for commonly used robot types such as the Pioneer2DX, Pioneer2AT and SegwayRMP.
- Realistic simulation of rigid-body physics: robots can push things around, pick things and generally interact with the world in a plausible manner.
- Player compatible: robots and sensors can be controlled through standard Player interfaces.
- New Stereo camera model: generates stereo image pairs, disparity and depth maps.
- New Completely re-written GUI using wxPython: most devices can now be directly controlled/inspected through the simulator GUI.
- New Plugin models: users can develop their own robot/sensor models, and have these models loaded dynamically at run time
- New Skins: simple geometric models may be augmented with realistic 'skins' from 3D modelling programs.
- Gazebo is free software, released under the GNU Public License. You are free to use, extend and modify Gazebo according to your needs.







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