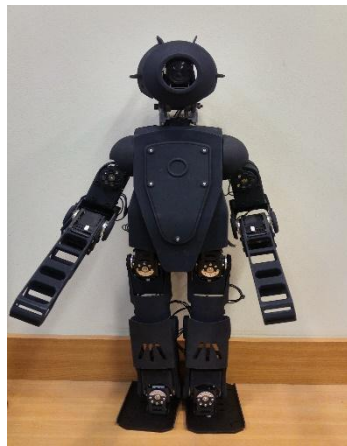


Team RoBIU - Robot Specification Document

Mechanical Design

We chose to use "HR-OS5 Humanoid Research Robot" which is based on Intelligence-Open Platform (DARwIn-OP) nicknamed *Jimmy*[1].



Profile



Without Shields

Figure 1: Jimmy's Photos

The robot's complete mechanical specifications is presented in figure 2

Humanoid Specification	
Height	68.5 CM / 27 Inches
Weight	6 kg / 13.2 lbs
DOF	20
Walking Speed	30 CM/s
Runtime	45 minutes
Actuators	12 x MX-106 / 6 x MX-64 / 2 x MX-28
Sensors	Gyro, Accelerometer, cameras , microphone
Processor	Intel NUC quad Core i5, 4gb RAM, 32 gig SSD
Sub Controller	CM730 (Arbotix-PRO coming soon)
Wireless Control Options	Xbee, Wifi, Bluetooth
Battery	4 cell 14.8V 4000 mAh LiPo
OS	Choice of Ubuntu 14.04 or Yocto OpenEmbedded Linux
Code	Open Source C++ framework based on the DARwin-OP software with integrated REST based API
Frame	5052 Aluminum Metal Brackets
Body Panels	3D printed Nylon

Height	
Weight	
DOF	
Walking Speed	
Runtime	
Actuators	
Sensors	
Processor	
Sub Controller	
Wireless Control Options	
Battery	
OS	
Code	
Frame	
Body Panels	

Figure 2: Jimmy's Mechanical Specifications

Actuators

The "HR-OS5 Humanoid Research Robot" uses the following Dynamixel Servos:

- 12 × MX-106T Dynamixel Actuator.
- 6 × MX-64T Dynamixel Actuator.
- 2 × MX-28T Dynamixel Actuator.

Sensors

The "HR-OS5 Humanoid Research Robot" uses the following sensors:

- 3-axis gyroscope
- 3-axis accelerometer for posture estimation and balancing.
- Camera - Sony ICX424 0.3 MP, 84 FPS, resolution 648x488.
- 3 microphones in the robot's head.

Controller

The "HR-OS5 Humanoid Research Robot" uses Intel NUC D54250WYB SBC, featuring Intel Core i5-4250U (Haswell 4th generation).

WiFi is enabled for team communication.

The robot has Arbotix-Pro/CM-730 ARM sub-controller. The Arbotix-Pro/CM-730 ARM connects between the servos and the NUC. The CM-730 is connected to the NUC via a USB port. The camera is connected to the NUC via a USB port as well.

References

- [1] HROS5-Framework wiki, <https://github.com/Interbotix/HROS5-Framework/wiki>.
- [2] Robotis Product Information, <http://www.robotis.com>.