

# Team Mexico RoboCup 2014 Humanoid KidSize Robot Specifications

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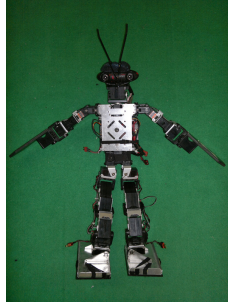
## Bogobot V2



**Fig. 1.** Bogobot V2, developed by ITESM

Height	52 cm	
Weight	3.5 kg	
Walking speed	20 cm/s	
DOF Leg	5	Dynamixel RX-28
DOF Arm	3	Dynamixel RX-24F
DOF Head	2	Dynamixel RX-24F
DOF Hip	0	
Total DOF	18	
Sensor	Camera	HD RocketFish webcam @ 25 fps
	Accelerometer	ADXL345
	Gyroscope	ITG-3200 dual-axis
Processing Unit	FitPC2	@2GHz, 2GB RAM, SSD, with WiFi

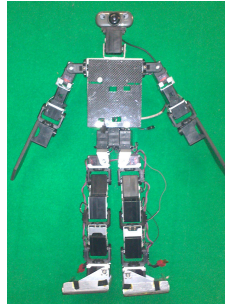
## Cyberlords T2



**Fig. 2.** Bogobot V2, developed by Universidad La Salle

Height	53 cm	
Weight	2020 g	
Walking speed	15 cm/s	
DOF Leg	6	KRS-2555HV digital servomotors by Kondo (Metal gears), 9 V - 12 V operating range, 14 kg cm @ 11.1V (stall torque), 429°/s @ 11.1V (no load speed)
DOF Arm	3	KRS-2555HV
DOF Head	2	HS-8498HB digital servomotors by HITEC (Karbonite gears), 6 V - 7.4 V operating range, 7.4 kg cm @ 6V (stall torque), 300°/s @ 6V (max speed)
DOF Hip	1	KRS-2555HV
Total DOF	21	
Sensor	Camera	Minoru Stereo webcam: 640 × 480 @ 15fps, 320 × 240 @ 30 fps, YCbCr (color space)
	6 DOF IMU	3 accelerometer axes, 300mV/g sensitivity, ±3g range, 3 gyroscope axes, 0.83mV/°/s sensitivity, ±300°/s range
	9 DOF IMU	3 accelerometer axes resolution ±16g (I <sup>2</sup> C interface), 3 magnetometer axes, magnetic field range ±8Oe (I <sup>2</sup> C interface), 3 gyroscope axes range, ±2000°/s (I <sup>2</sup> C interface)
Processing Unit	Roboard RB-110	based on the 32-bit x86 Vortex86DX CPU, 1 GHz, 256 MB RAM, RS-485, 16 PWM, USB 2.0, RS-232, SPI/I <sup>2</sup> C bus, 8 10-bit ADC ports, mini PCI, microSD, 2 hi-speed serial, 400 mA @ 5V (power), 96 mm × 56 mm, 40 g
Processing Unit	Kondo RCB4	based on the M16C/26A MCU by Renesas, 8 SIO ports for two systems of ICS3.0 compliant device, 10 AD ports, 10 PIO ports, COM ports max speed 1.25Mbps

## Cyberlords T3



**Fig. 3.** Bogobot V2, developed by Universidad La Salle

Height	57 cm	
Weight	2200 g	
Walking speed	15 cm/s	
DOF Leg	6	KRS-2555HV digital servomotors by Kondo (Metal gears), 9 V - 12 V operating range, 14 kg cm @ 11.1V (stall torque), 429°/s @ 11.1V (no load speed)
DOF Arm	3	KRS-2555HV
DOF Head	2	KRS-2555HV
DOF Hip	1	KRS-2555HV
Total DOF	21	
Sensor	Camera	Logitech C210 Webcam 640 × 480 @ 30fps, YCbCr
	6 DOF IMU	3 accelerometer axes, 300mV/g sensitivity, ±3g range, 3 gyroscope axes, 0.83mV/°/s sensitivity, ±300°/s range
	9 DOF IMU	3 accelerometer axes resolution ±16g (I <sup>2</sup> C interface), 3 magnetometer axes, magnetic field range ±80e (I <sup>2</sup> C interface), 3 gyroscope axes range, ±2000°/s (I <sup>2</sup> C interface)
Processing Unit	2 Gumstix Overo Fire COM with Summit board	based on TI OMAP 3530: ARM Cortex-A8 CPU + C64x+ DSP core, DVI-D, USB, 6 PWM, I2C port. SPI bus, 6 A/D, 802.11g

**DARwIn-OP****Fig. 4.** DARwIn-OP, developed by ROBOTIS

Height	45.5 cm	
Weight	2.8 kg	
Walking speed	24 cm/s	
DOF Leg	6	Dynamixel MX-28+
DOF Arm	3	Dynamixel MX-28+
DOF Head	2	Dynamixel MX-28+
DOF Hip	0	
Total DOF	20	
Sensor	Camera	C905 HD webcam by Logitech, HD 1280×720 @ 30fps (max rate) YUV (color space)
	IMU	6 DOF IMU 3 accelerometer axes 3 gyroscope axes
Processing Unit	FitPC2i	by CompuLab, based on the Intel Atom Z530 microprocessor 1.6 GHz @533MHz FSB L2-512KB, 1GB DDR2 RAM, 2 USB, 4GB NAND flash disk, 802.11 b/g/n, 1 Gigabit Ethernet 5-7 W (power consumption) 104 mm × 96 mm × 23 mm, 92 g

**NimbRo-OP****Fig. 5.** NimbRo-OP, developed by Universität Bonn

Height	90 cm	with modified head
Weight	6.6 kg	
DOF Leg	6	Dynamixel MX-106
DOF Arm	3	Dynamixel MX-64
DOF Head	2	Dynamixel MX-64
DOF Hip	0	
Total DOF	20	
Sensor	Camera	Logitech C905 with wide angle lens
	IMU	Inertial sensors in Robotis CM-730 controller, 3-axis accelerometer, 3-axis gyro
Processing Unit	Zotac ZBOX nano XS	Dual-Core PC, AMD E-450 processor (2x1.65GHz), 2GB RAM, 64GB SSD, USB 3.0, HDMI, Gigabit Ethernet, Memory card slot