Robots of the Hamburg Bit-Bots for RoboCup 2026

April 12, 2026

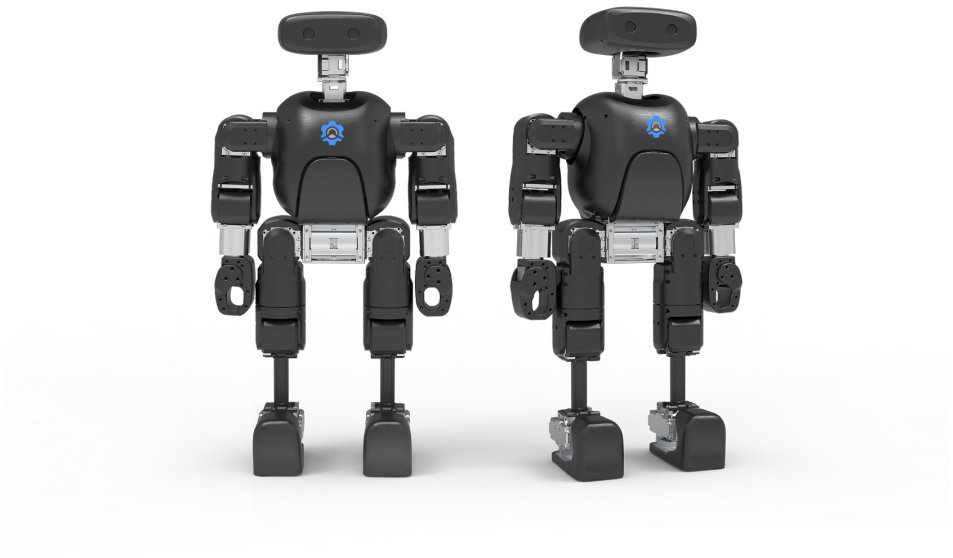

Figure 1: HIGHTORQUE Mini Pi Plus. Source: `https://store.hightorque.cn/products/bipedal-robot-mini-pi-plus`

Name of type	HIGHTORQUE Mini Pi Plus
Height	650 mm
Weight	10.9 kg (including battery)
Degrees of freedom	22
Actuators	Custom brushless actuators @ maximum 16 Nm
Type of sensors	3-axis gyro 2x 3-axis accelerometer ZED Mini RGBD Camera Microphone Array
Computing unit(s)	NVidia Jetson Orin NX

Due to manufacturer confidentiality, we cannot provide further details on this robot at this point.

Figure 2: Wolfgang-OP. Source: Hamburg Bit-Bots

Name of type	Wolfgang
Height	825 mm
Weight	7.1 kg (including battery)
Walking speed	0.35 m/s
Degrees of freedom	20
Actuators	8 DYNAMIXEL MX 64 (arms+head) 12 DYNAMIXEL MX106 (legs) 2 DYNAMIXEL XH540-W270 (knees)
Type of sensors	2 3-axis gyro (BMI088) 2 3-axis accelerometer (BMI088) Basler acA2040-35gc Camera with Lense: LM5NCL | 1/1.8" 4.5mm C-Mount foot pressure sensors (`github.com/bit-bots/bit_foot`)
Computing unit(s)	Intel ASUS PN51
Materials	Aluminum (torso, hip, ankle and shoulder connectors) CFRP (Legs and Arms) PLA (head, feet, and spacers) Ninjatek Ninjaflex (bumpers, flexible elements in shoulder roll and head tilt joint)
Electronics	Wolfgang CORE (`github.com/bit-bots/wolfgang_core`) IMU board (`github.com/bit-bots/bitbots_imu_dxl`) Voltage Regulation (`github.com/bit-bots/wolfgang_constant_voltage`) Foot Sensors (`github.com/bit-bots/bit_foot`)
Battery	6S1P 3500mAh LiPo
Robot Model	open source: `github.com/bit-bots/wolfgang_robot`

For more information please refer to *M. Bestmann, J. Güldenstein, F. Vahl and J. Zhang, "Wolfgang-OP: A Robust Humanoid Robot Platform for Research and Competitions," 2020 IEEE-RAS 20th International Conference on Humanoid Robots (Humanoids), 2021, pp. 90-97, doi: 10.1109/HUMANOIDS47582.2021.9555808.*