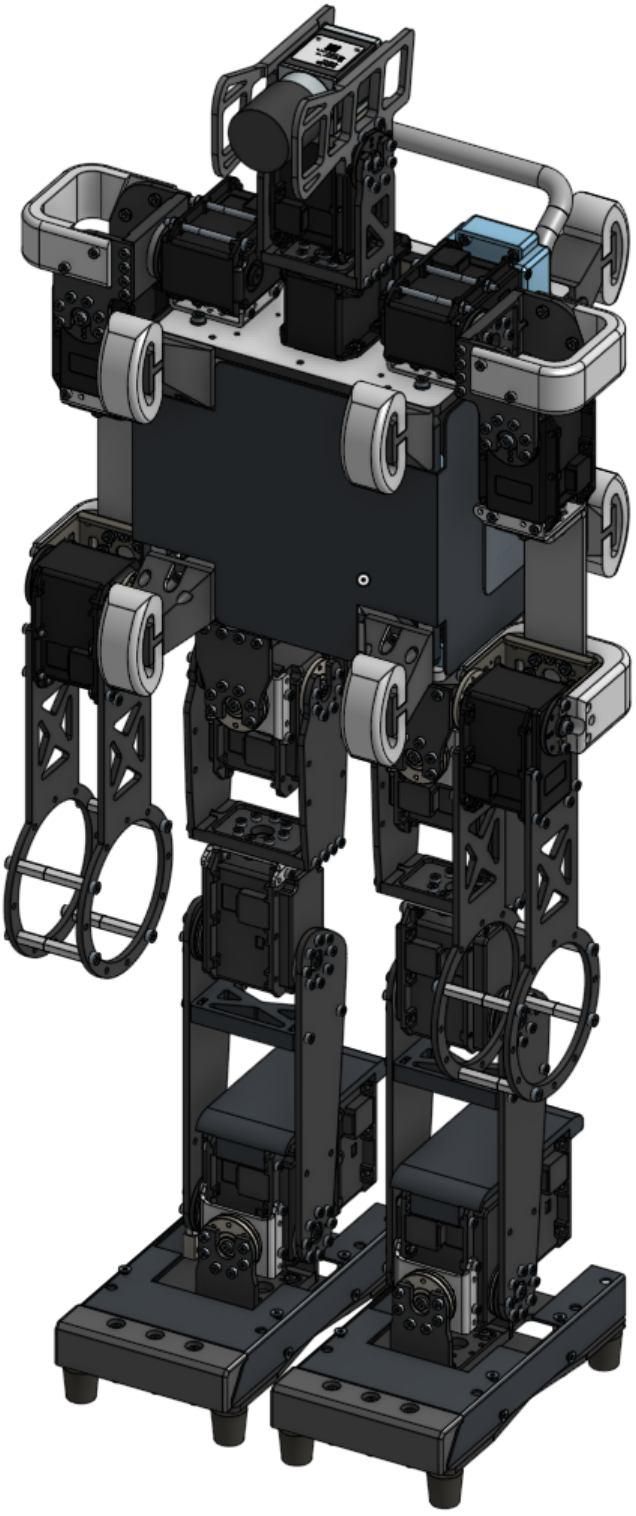
Robots of the Hamburg Bit-Bots for RoboCup 2024

January 27, 2025

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.*



Name of type	Bitban
Height	670 mm
Weight	6.5 kg (including battery)
Degrees of freedom	20
Actuators	10 DYNAMIXEL MX 64 (arms+head+hips) 12 DYNAMIXEL MX106 (legs)
Type of sensors	4 3-axis gyro (BMI088) 4 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) PLA and PETG Ninjatek Ninjaflex (bumpers)
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

This robot is based on the Sigmaban 2023 version of the Rhoban Team. The kinematics are planned to be identical, but it will feature the electronics from our previous platform with some upgrades.