



Roombots

Modular robotics for adaptive and self-organizing furniture that moves, self-assembles, and self-reconfigures. Our dream is to provide multi-functional modules that are merged with the furniture and that lay users and engineers can combine for multiple applications.



Key Features

- Controlled from centralized PC; commands over serial port or Bluetooth
- 3 degrees of freedom and 2 active connection mechanisms per module
- Local sensors to detect docking position
- 10 connection surfaces per module
- 2 LED rings per module for visual feedback
- Extensible with specialized elements (Universal Gripper, LED spotlight, camera + on-board PC)
- One module can lift another module and up to 500 g as payload in the end effector
- Easy-to-use GUI (based on Unity; only visualization, no physics)
- Position, speed or Central-Pattern-Generator (CPG) control
- Off-grid (free) and on-grid locomotion

Possible Applications

- Rapid prototyping of robots by coordinating multiple modules
- Automatic construction of shapes or objects
- Smart moving manipulator or spotlight
- Novel interface to control and coordinate multiple modules at the same time

Access information

Corresponding infrastructure	École Polytechnique Fédérale de Lausanne BioRobotics Lab
Location	Route Cantonale, 1015 Lausanne, Switzerland
Unit of access	Working day



Technical specifications

Outer dofs specs	31.5 RPM (no load), 8.4 Nm (nominal)
Inner gearbox reduction	366:1 (custom made)
Overall dimensions	110x110x220 mm (4.3?x4.3?x8.7?)
Weight	1.7 kg (3.1 lb)
Degrees of freedom	3 (continuous rotational)
Number of connection surfaces	10 (active or passive)
Active connection type	4-way symmetrical gender-less mechanical latches
Energy source	4-cell LiPo battery, 1200 mAh. Autonomy ~1 hour
Communication	Bluetooth
Inner dof specs	20.4 RPM (no load), 4.3 Nm (nominal)
Outer motors	Maxon RE 25
Inner motor	Maxon RE-max 24
Outer gearboxes reduction	305:1 (custom made)

Additional information

<https://biorob.epfl.ch/roombots>