



ARMAR 6

ARMAR-6 is a collaborative humanoid robot assistant for industrial environments. Designed to recognize the need of help and to allow for an easy and safe human-robot interaction, the robot's comprehensive sensor setup includes various camera systems, torque sensors and systems for speech recognition. The dual arm system combines human-like kinematics with a payload of 10 kg which allows for dexterous and high-performant dual arm manipulation. In combination with its telescopic torso joint and a pair of underactuated five-finger hands, ARMAR-6 is able to grasp objects on the floor as well as to work in a height of 240 cm. The mobile platform includes holonomic wheels, battery packs and four high-end PCs for autonomous on-board data processing. The software architecture is implemented in ArmarX (<https://armarx.humanoids.kit.edu>). High-level functionality, like object localization, navigation, grasping and planning are already implemented and available.



Key Features

- Holonomic movement of the mobile platform
- Various control modes enable the execution of precise and torque/force-controlled motions
- Dexterous arm system with 2x8 DoF for dual arm manipulation
- Limitless rotation in shoulder, upper arm and forearm
- Control architecture with memory and attention system
- Underactuated five-finger hands

Possible Applications

- AI: symbolic planning and execution monitoring
- Cognitive robotics: learning multimodal representations, affordances
- Physical human-robot interaction
- Semantic scene understanding and affordance extraction
- Task space impedance control
- Gravity compensated torque control
- Dual arm manipulation
- Force and torque based control and interaction
- Natural speech dialog
- Human-robot interaction
- Vision-based grasping and deep learning for grasping
- Imitation Learning, Programming by demonstration



Access information

Corresponding infrastructure	Karlsruhe Institute of Technology Institute of Anthropomatics and Robotics - High Performance Humanoid Technologies Lab (IAR H2T)
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Location	Adenauerring 2, 76131 Karlsruhe, Germany
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Unit of access	Working day
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Technical specifications

Arm range	130 cm
Total Weight	160 kg (without battery packs)
Arm span width	310 cm
Payload (single arm)	10 kg (long range), 14 kg (mid range)
Computers	4 high-end PCs, 1 GPU
Robotic Framework	ArmarX (previous framework MCA)
Total Height	192 cm
Software	ArmarX (https://www.armacx.humanoids.kit.edu)
Working height	0 – 240 cm
Platform speed	1 m/s
Bus system	CAN-Bus (CANopen)
DoF	27

Additional information

ArmarX: <https://armacx.humanoids.kit.edu>

Additional Information: Available [here](#) and [here](#).