

Artemis

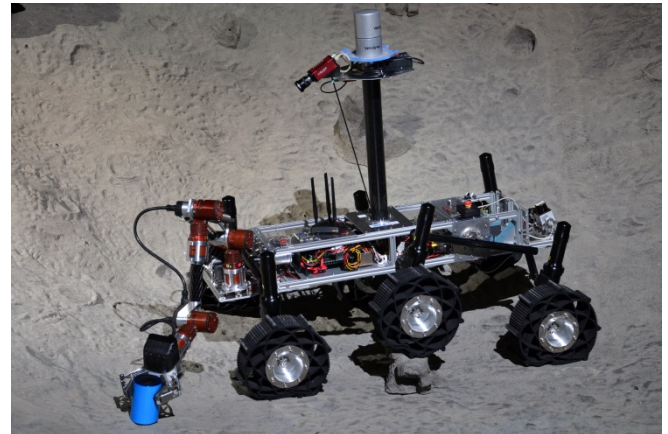
DLR SpaceBot Cup 2013 Rover

System Description

The SpaceBot rover has been built up within eight months for the DLR SpaceBot competition 2013. In that competition the rover had to autonomously collect several objects in an unknown environment. Both staff and students participated in the development and formed the team Artemis. Due to the requirements of the competition the rover is equipped with powerful sensors and a manipulator arm. It is highly mobile by using a triple bogie suspension and rubber treads.

Technical Details

- **Size:** 1.2 m x 0.8 m x 1.07 m
- **Weight:** 75 kg
- **Speed:** 0.1 m/s
- **Runtime:** 1 h
- **Actuators:** 12 x 48 V RoboDrive BLDC motors / Harmonic Drive gears for the wheel hub drives and for the manipulator arm; 6 x 48 V Faulhaber BLDC motors / Harmonic Drive gears for the steering shafts; 3 x Dynamixel MX-28 servos for the manipulator and the laserscanner tilt unit;
- **PC:** Kontron KTQM77/mITX i7 Quadcore
- **Communication:** Asus RT-AC66U Dual Band 3 x 3 802.11ac Gigabit Router
- **Sensors:** Velodyne HDL-32E, Hokuyo UTM-30LX, Logitech Webcam C910 / C920, IMU Xsens MTi-28A53G35
- Artemis is equipped with high internal processing power and a reliable wireless communication.
- The rover is capable of creating accurate maps of its environment and to estimate its pose precisely by using a Graph SLAM which has been optimized for the high-performance **Velodyne HDL-32E laser scanner**.
- The **Hokuyo laser scanner** which has been mounted beside the manipulator arm is used to scan the front area of the rover and to gather dense point clouds for object detection.
- **The Logitech cameras** which are placed on the central sensor tower and in the front chassis are used to:
 - support the operator with a 360 ° view of the environment
 - execute a color- and gradient-based object detection
 - support manipulation tasks



Application: Space Robotics, SAR & Security Robotics

Projects: **SpaceBot**
DLR SpaceBot-Cup: ARTEMIS – Autonomous Rover Team for Exploration and Manipulation Intended for SpaceBot (03/2013 - 11/2013)



Contact:
DFKI GmbH & University of Bremen
Robotics Innovation Center

Director: Prof. Dr. Frank Kirchner
Phone: +49 421 – 178 45 4100
E-mail: robotik@dfki.de
Website: www.dfki.de/robotics