German Research Center for Artificial Intelligence

Coyote III

Highly Mobile and Modular Micro Rover for Cooperative Tasks

System Description

Coyote III is a micro rover with high mobility performance in unstructured terrains. Equipped with its own power source, on-board sensor suite and on-board computer it is able to perform exploration tasks autonomously. Moreover, the communication subsystem enables the rover to cooperate with other systems. Coyote III is equipped with two standardized electro-mechanical interfaces, allowing to dock additional payload elements, such as standardized payload items or a manipulator. Due to the lightweight and robust structural design of Coyote III, it is possible to apply several kilograms of additional payload to the rover. The modular design approach allows to adapt the rover structure according to specific payload requirements.

Technical Details

- **Size:** 994 x 584 x 380 mm
- **Mass:** 12.5 kg (excl. Payload subsystems), ~ 20 kg (incl. Payload subsystems), 10 - 15 kg Payload capacity
- **4-Wheel drive:** Robodrive ILM 50x08 BLDC-motor with Harmonic Drive gearing (80:1)
- **Wheel torque:** 22.4 Nm (nominal)
- **Speed:** 1.3 m/s
- **Laser range finder:** Hokuyo UST-20LX
- **Camera:** Basler Ace (2048 x 2048 px, 25 fps)
- **IMU:** Xsens MTi-300 AHRS
- **Driving sensors:** Absolut Encoder
- **On-board computer:** IntelCore i7-3517UE, 1.7 GHz
- **Motor control:** Distributed FPGA based control
- **Mobile access point:** 2.4 GHz, 802.11n
- **Remote control:** Bluetooth
- **Remote stop:** 868 MHz Xbee-Pro
- **Power supply:** LiPo primary battery: 44,4 V; 4,5 Ah (opt. external power supply)
- **Power consumption:** ~ 75 W (average)
- **Chassis:** Passive roll joint at rear axis
- **Wheels:** Hybrid legged-wheels (5 legs)
- **Structure:** CFRP based semi-monocoque housing paired with lightweight aluminum structure

Coyote III with fully integrated rover system-bus

Application: Space Robotics, Search and Rescue (SAR)

Projects: TransTerrA, SherpaTT Field Trials Utah Coyote III

Coyote III equipped with the manipulator module SIMA

Contact:
DFKI GmbH & University of Bremen
Robotics Innovation Center

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