

# Team Information



Picture of vehicle:

Name of vehicle: RTS-HANNA



Picture of team leader:

Name of team leader: Prof. Dr.-Ing. Bernardo Wagner  
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# Team Information

## Team Description:

The Institute for Systems Engineering (ISE) deals with the modelling, simulation, analysis and realisation of hardware and software architectures of complex and technical systems.

The Real Time Systems Group (RTS) is part of the Institute for Systems Engineering. Head of the RTS is Prof. Dr.-Ing. Bernardo Wagner. The RTS focuses its work on the fields of distributed automation systems and mobile service robots. Such systems have to interact with real surroundings in a correct, reliable and secure way and furthermore with deterministic time response, that is in real time.

For C-ELROB 2011 the RTS is using its outdoor platform RTS-HANNA which was successfully introduced at the M-ELROB 2008 and participated at the ELROBs in 2009 and 2010 as well. The robot is based on a Kawasaki Mule 3010 side-by-side vehicle. Equipped with a drive-by-wire retrofit kit from PARAVAN GmbH, this vehicle is fully controllable via computer. The four-wheel drive with differential-lock allows operation in urban as well as in heavy non-urban terrain. The maximum speed of the vehicle is 40 Km/h and the payload 600 kg. RTS-HANNA is equipped with various sensors for tele-operation, semi-autonomous operation and fully autonomous operation. The main sensors are 3D laser range scanners used for environmental perception. In addition, multiple cameras, Differential-GPS and inertial sensors are used for vehicle control.

The navigation algorithms used on our robot are based on sensor data fusion of laser, inertial and DGPS data. Our focus lies on the incorporation of 3D sensor data into robot tasks like autonomous obstacle avoidance, autonomous object recognition as well as robot localization.

Based on the sensor- and navigation-system the RTS is continuing its work on fully autonomous vehicle control and semi-autonomous operation at long distances via a communication channel of limited bandwidth. In this context RTS-HANNA is utilized as a demonstrator for robotic technology that can be adapted to any steer-by-wire platform.

## Sponsors:

no sponsors

## Selection of scenario:

1. Reconnaissance and surveillance
2. Camp Security
3. Autonomous navigation
4. Transport - Mule