Team Information

Picture of vehicle:

Name of vehicle: MuCAR-3

Picture of team leader:

Name of team leader: Prof. Dr.-Ing. Hans-Joachim "Joe" Wünsche

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Team Information

Team Description:

Team MuCAR is a new team being formed at the University of the Bundeswehr Munich (UBM) by Prof. Dr.-Ing. H.-J. Wuensche, professor for "Autonomous Systems Technology" and successor of Prof. Dr.-Ing. E.-D. Dickmanns at UBM.

As Prof. Dickmanns had retired four years before Prof. Wuensche came, the team is just now being rebuild with a new vehicle and new team members, utilizing the concepts of existing software packages and the support of former graduates of this Institute but basically starting fresh.

Our vehicle is named "MuCAR-3", as this is the third generation of our **Mu**nich **C**ognitive, **A**utonomous Ca**r**s. The first generation vehicle was "VaMoRs", which demonstrated fully autonomous driving on a not yet opened German Autobahn at its maximum speed of 96 km/h 20 years ago in 1987, covering a distance of 20 km. The second generation vehicle "VaMP" established further records in 1995, when it drove from Munich to Denmark and back for a distance of almost 1800 km, of which about 1660 km were fully autonomous at speeds up 180 km/h. Both vehicles have retired to museums. The new vehicle was chosen to be a good vehicle both for participating in traffic on public roads as well as for off-road driving.

MuCAR-3 is based on a stock VW Touareg with a V6 TDI engine, modified to allow computer control of steering, brake and throttle. Full body skid plates allow testing in rough terrain.

Apart from inertial sensors UBM will continue to focus on vision as the main sensor for perception, as this sensor provides most of the information humans need for driving. In addition other sensors such as laser scanners might be used for special applications such as off-road driving, until our vision systems can fully cope with those scenarios as well.

The main vision sensors are 3 forward looking cameras placed on a two-axis platform inside the vehicle. The arrangement resembles the human vision system, with a tele-camera as "fovea" and 2 slightly outward pointed wide angle cameras for peripheral vision. All cameras are mounted on a yaw axis platform to allow for active control of the horizontal viewing direction, with the tele-camera mounted such, that its narrow field of view of 4 deg is inertially stabilized by looking through a fast moving mirror counteracting disturbances coming from the road (much like we humans are able to focus and stabilize our attention even on rough roads), while it can also be directed towards special areas of interest.

Sponsors: None

Selection of scenario: Scenario 4: Autonomous Reconnaissance

Proof of citizenship: Copy of team leader passport is enclosed