Press Release

EtherCAT Robots win German Open

Equipped with EtherCAT, the soccer robots of the Dutch Team Tech United Eindhoven won the RoboCup German Open in Hanover, Germany. In the semi-final they defeated the acting world champion of the Middle Size League, the Brainstormers Tribots from Osnabrück, Germany; a team that had not been beaten since 2004. In the finals it took a penalty shoot-out to beat the current number 3 in the world ranking, the CoPS Team from Stuttgart. The Tech United Robots use EtherCAT for interfacing to drives, sensors and actuators.

Six Players form a team in the Middle Size League, the largest and fastest division in the RoboCup competition. Top speed is approximately 4 m/s. Each of the three-wheeled robots weighs around 35 kg and acts autonomously without remote control. The robots have different roles such as goalkeeper, defender or striker and cooperate with each other in a team effort. Communication with the other team members is established through wireless Ethernet. Vision is provided by a camera pointing upwards towards a parabolic mirror, thus creating a 360° view of its surroundings. Using this image, the robot is able to determine its position. A feature that distinguishes Tech United of the Eindhoven University of Technology from other mid-size RoboCup teams is the active ball-handling mechanism. With two levers equipped with motor-driven wheels, the ball can be pulled as well as pushed. The kicking mechanism device can produce flat shots as well as lob shots – a feature that proved to be very effective in the semi-final. The robot controller is a mini PC with an EtherCAT Open Source master. EtherCAT was chosen for its superior performance at low CPU load while not requiring any hardware extensions on the mini PC. Furthermore, it was easy to implement; and all required devices and components were available.

The RoboCup German Open is considered to be the ideal preparation tournament for the upcoming World Championships which will take place in July in Suzhou, China.

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RoboCup is an international joint project to promote artificial intelligence (AI), mobile robotics, and related fields. It is an attempt to foster AI and robotics research by providing a standard problem where a wide range of technologies can be integrated and examined. RoboCup chose to use the soccer game as a central topic of research, aiming at innovations to be applied for socially significant problems and industries.

The ultimate goal of the RoboCup project is to develop a team of fully autonomous humanoid robots by 2050 that can win against the human world champion team in soccer.

In order for a robot team to actually perform a soccer game, various technologies must be incorporated including: design principles of autonomous agents, multi-agent collaboration, strategy acquisition, real-time sensor data processing, real-time reasoning, robotics, and sensor-fusion. RoboCup is a task for a team of multiple fast-moving robots under a dynamic environment.
(Source: www.robocup.org)

EtherCAT sets new standards for real-time performance and topology flexibility, while meeting or undercutting fieldbus cost levels. EtherCAT features include high precision device synchronization, a cable redundancy option, and a functional safety protocol (SIL3).

The **EtherCAT Technology Group** (ETG) is an organization in which key user companies from various industries and leading automation suppliers join forces to support, promote and advance the EtherCAT technology. With over 750 members, the EtherCAT Technology Group has become the largest organization in the world that is exclusively focused on Industrial Ethernet technologies. Founded in November 2003, it is also currently the fastest growing fieldbus organization.

For further information please see **www.ethercat.org**

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Press pictures

Picture caption:
RoboCup Team Tech United of the Eindhoven University of Technology equipped with EtherCAT

Picture caption:
EtherCAT is the interface to drives, sensors and actuators.