Interdisciplinary Project
Virtual 3D environment for agricultural vehicles

Task

ROS is a powerful platform to develop mobile robotic algorithms. To test algorithms in virtual environment, virtual world, objects and vehicles need to be modeled. ROS offers multiple options for simulations. The mostly used one in roboticists is Gazebo, which offers 3D simulation environment, including sensor data simulation. In order to make your own robot and task functional, 3D objects and scenario need to be designed. Usually vehicles are engineered in engineering CAD software, like Catia, Solidworks or Inventor. The task of this thesis is to study the workflow from CAD softwares to Gazebo, including vehicles, but also terrain modeling and plant/tree modeling. The specific challenges are numerous different data formats for 3D objects, and conversions between those. The application of this thesis includes tractor working in the 3D field and another one is a robot working in the forest with trees.

Work packages
- Conceptualization of a scenario with the help of instructor
- Design of the objects using a CAD software (Catia, Solidworks and/or Blender)
- Including the designed objects to Gazebo environment and implementation of the scenario
- Documentation (preferably English)

Prerequisites
- Being a good team player
- Basic programming skills
- Basic level of Linux knowledge is beneficial
- Interest in realistic 3D design
- Structured and independent way of working

Start: October
Send your application by email to ertug.olcay@tum.de including
- A short email elaborating your background and motivation
- Curriculum vitae (CV)