INF FAKULTÄT FÜR INFORMATIK

Kickoff Software/Team Project Robocup@Work

Prof. Mostaghim, Jun.-Prof. Zug, Christoph, Steup
Chair of Intelligent Systems, Chair of Embedded Smart Systems

Organization

- Time and location:
  - Start: 14.10.2015
  - End: 17.02.2016
  - Lab: G29-035
- Contact:
  - Christoph Steup: steup@ovgu.de
  - Kai Seidensticker: kai.seidensticker@st.ovgu.de
- Meetings:
  - Individual meetings for each group: every week (time will be set by the lecturer)
  - Get together meetings for all: every two weeks (Wednesdays 15:00 – 16:30 G29-035)

Teams

- 4 teams of maximum 4 students
- Team organization: one team leader and two or three members
- Team leader:
  - Distributes the subtasks and takes car of the entire process
  - Communicates with the lecturer
  - Responsible for the documentation
- Presentations must be done by all the members
- Prerequisites:
  - Courses: PKES + TI2 | Control Theory
  - Programming: C/C++ | Python fluently
  - Enthusiasm and teamwork

Evaluation

You must deliver

- Working Prototype
- Code
- Documentation
- Project management
- A talk of maximum 20 minutes on February 17th , 2016
- Video or Demo depending on task

- Bachelor students may get a “ungraded certificate”
- Master students get an individual grade

Topics

- Evaluation of the Alternative Navigation Algorithm Nav2D
- Evaluation of the Alternative Navigation Algorithm OMPL
- Simulator for the @Work League
- Evaluation of Vision-based Object Recognition

Evaluation of the Alternative Navigation Algorithm Nav2D

- Evaluation of Nav2D: http://wiki.ros.org/nav2d
- Using existing Nav Setup
- Integration in current youbot setup
- Metrics:
  - Path Length
  - CPU-Time
  - Collisions

Evaluation of the Alternative Navigation Algorithm OMPL

- Evaluation of OMPL as Nav Stack Planner:
  https://github.com/windelbouwman/move-base-ompl
- Using existing Nav Setup
- Integration in current youbot setup
- Metrics:
  - Path Length
  - CPU-Time
  - Collisions

Simulator for the @Work League

- Extension of current Simulation Frameworks
- Using VREP as Simulator: http://www.coppeliarobotics.com/
- Integration of extended youbot model: https://github.com/mfueller/vrep_youbot_plugin
- Integration of obstacles, tables, walls and objects
- Goal: Navigate using RobOTTO framework in simulation
- Evaluation: Comparision between Real Robot navigating in arena and simulation on integration weekend

Evaluation of Vision-based Object Recognition

- Evaluation of current Object Detection
- 3D-Object Detection already implemented
- Different Environmental Conditions (Light, Reflections, Object Surfaces)
- Problem identification and mitigation
- Goal: 90% Detection and Classification Rate
- In Cooperation with RobOTTO Team