Computer Vision for Agricultural and Humanoid Robots!

We offer Bachelor/Master theses and IDP projects in the field of computer vision and robotics, in collaboration with the Chair for Computer Aided Medical Procedures & Augmented Reality.

The project topics concern the application of computer vision and 3D perception techniques to humanoid robotics and agricultural robotics. In particular, they focus on one of the following three tasks:

**Fruit recognition for autonomous harvesting**

The project aims to develop an object recognition and pose estimation technique to be applied on the existing vision framework of the harvesting robot developed at the Chair of Applied Mechanics (showcased in this video). Specifically:

- Use the existing vision framework to connect with the robot
- Develop a descriptor matching strategy for localizing fruits (sweet peppers and apples) in the camera field
- Estimate the 3D pose of the recognized fruits

**Object detection and tracking for the humanoid Lola**

Lola is the humanoid being developed at the Chair of Applied Mechanics (as shown in this demonstrative video). The main task of this project is to develop an object detection and tracking module that runs in parallel with the existing threads on Lola’s operative system and detect a specific object class (e.g., a chair or a box) in the scene while keeping track of it. The goal is to allow the humanoid to follow the object moving around a scene through its navigation and locomotion modules.

**SLAM for the humanoid Lola**

The goal of this project is to integrate a Simultaneous Localization and Mapping (SLAM) algorithm as an additional perception module within Lola’s operative system. Through SLAM, we aim to reduce the drift currently present in the robot’s kinematic system, as well as be able to obtain a 3D reconstruction of the environment necessary for the estimation of surfaces (in particular, walls) that are present in the surrounding environment.

What do you need for this project?

- You are familiar with C++
- You are interested in image processing and robotics
- You are motivated and willing to work in an inter-disciplinary team
- (Optional) You have some knowledge of PCL

More about our project: http://www.am.mw.tum.de/

Start: as soon as possible.

Interested?

Please feel free to contact us:

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