

Software for a Service Robot

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July 2019

1 Abstract

Robotics is currently one of the areas with greater growth potential inside Artificial Intelligence, given its many applications and the current state-of-the-art that allows for many tasks that were recently seen as possible to be completed by humans only, to be done by robots.

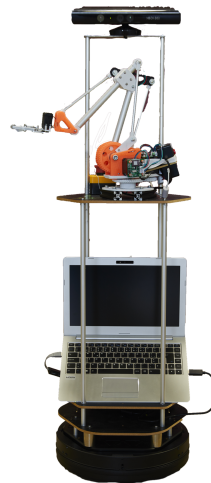
The robocup@home competition aims to develop robots to assist in personal domestic situations. It requires the robots to have many capabilities, such as, human-robot-interaction and cooperation, navigation and mapping in dynamic environments, computer vision and object recognition, object manipulation, among others [1].

At SOCIA-lab we have been working on modules to allow a robot to solve several of the problems that arise in this competition (mapping, grasping, navigation, among others) [2–5, 7].

2 Goals

With this project we want to integrate all the developed code into a single framework, and also to develop and/or install code to solve other tasks, such as voice recognition.

The code will be done on the Robot Operating System (ROS) [6] in Python and/or C++ and will run on our modified version of a Turtlebot 2 robot.



3 Tasks

T1: Review of existing work at the lab for this robot and research of new algorithms for the remaining functionality.

T2: Implement the proposed methods.

T3: Make extensive evaluation on real world scenarios.

T4: Write the thesis and a scientific paper.

4 Schedule

Task	Start date	Duration
T1	2019-10-01	2 months
T2	2019-12-01	4 months
T3	2020-04-01	1 month
T4	2020-05-01	2 months

References

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- [7] Abel Zacarias and Luís A. Alexandre. Application of lifelong learning with CNNs to visual robotic classification tasks. In *24th Portuguese Conference on Pattern Recognition, RECPAD 2018*, Coimbra, Portugal, October 2018.