Cloud Robotics: Implementing Robotic Algorithms as Services

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1 Abstract

The computational capabilities that robots carry with them are usually limited, since some restrictions of autonomous robots include weight, battery and size, which all tend to make a robot use small and lightweight computers.

On the other hand, most robotic algorithms are computationally demanding. This makes the case for a robot to offload its more computationally demanding task to a cloud system. Some frameworks exist for making cloud robotics, among which are RoboEarth, Rapyuta, KnowRob, RoboBrain and ROS [1].

In this thesis we want to survey the available choices for cloud robotics frameworks and justify the choice of one of them. Another goal is to implement some basic robotic algorithms to work as a service in a cloud and test them on real robots.

2 Goals

The main goal of this thesis is to choose and setup a cloud robotics framework at SOCIA lab and to make some existing algorithms available as services. A Turtlebot 2 robot is available at SOCIA lab for the real world experiments. Possible algorithm candidates for deployment as a service are navigation, object recognition, speech recognition and activity recognition.

3 Tasks

T1: State-of-the-art in cloud robotics.

T2: Setup of a framework for cloud robotics and make some existing algorithms available as services.

T3: Make extensive evaluation on real world scenarios.

T4: Write the thesis and a scientific paper.

4 Schedule

Task	Start date	Duration
T1	2016-10-01	2 months
T2	2016-12-01	3 months
T4	2017-03-01	1 month
T5	2017-04-01	3 months

References

[1] Morgan Quigley, Ken Conley, Brian Gerkey, Josh Faust, Tully B. Foote, Jeremy Leibs, Rob Wheeler, and Andrew Y. Ng. ROS: an open-source robot operating system. In *ICRA Workshop on Open Source Software*, 2009.