

Online 3D Object Recognition

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1 Abstract

There is a recent interest in using 3D data given the availability of cheap RGB-D sensors [8]. Object recognition is among the many different tasks that the information from these sensors can be used for [1].

The usual approaches to learning consider a setup where the learning is made offline before the classifier is applied to the tasks.

In this thesis we want to develop a online learning approach to solve 3D object recognition problems, expanding on the work in [2], introducing the capability of functioning online with continuous learning.

2 Goals

The main goal consists in developing a spatio-temporal filter [3–7, 9] capable of extracting object representations that can be used to recognize objects and their poses from 3D images (point clouds), and making it work online.

Another goal consists in making the code available to other researchers.

The code is developed in linux using C/C++. The PCL [8] will be use for 3D point cloud capture and processing.

A good knowledge of programming, probabilities and English language is necessary.

3 Tasks

T1: State-of-the-art in 3D object recognition and spatio-temporal learning methods.

T2: Evaluate and try to adapt existing approaches for different problems (activity recognition, face recognition, etc.) to our problem.

T3: Implement new spatio-temporal filters for object recognition taking advantage of TL approaches.

T4: Make extensive evaluation on public data sets.

T5: Write the thesis and a scientific paper.

4 Schedule

Task	Start date	Duration
T1	2016-10-01	2 months
T2	2016-12-01	2 months
T3	2017-02-01	1 month
T4	2017-03-01	1 month
T5	2017-04-01	3 months

References

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