Institute of Robotics, University of Innopolis

Intelligence Mobile Robotics
Home Work 02
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1 Task One

Figure 1: An example scanned view of a laser

Task one is related line the extraction techniques which you have studied in class. Your task is to scan your room with the provided laser and try to extract the lines and segment them properly. There are two HOKUYO laser sensors at your service. You can get them in the laboratory (room 466a) and bring them back during working hours. There is a data acquisition software available for this sensor (check the manufacturer's website) or else you may use any software for processing, but provide them with the links and instructions on running your code. In your report, include the room description, used implementations of algorithms. For the line extraction, you must develop your own implementation of split-and-merge and line-regression. You may use any existing implementation for Hough transform. In the end, compare the results of the line extraction in terms of algorithm speed (absolute time). **(Points: 2.5)**

2 Task Two

Id	Name
01	Sabirova Adelya
02	Ahmed Nawaz
03	Andrey Stepanov
04	Arslan Siddique
05	Aydar Ahmetzyanov
06	Dmitriy Desyatkin
07	Lyailya Aminova
08	Maksim Rassabin
09	Oleg Balakhnov
10	Sami Sellami
11	Valeriya Skvortsova
12	Victor Massague Respall
13	Víctor Fernando Pérez García

In this task, you are going to touch upon a step into a tracking problem especially into data association. Each of you is provided with an image sequence of a scenario. After browsing your image set, try to seek an object which is moving through a few images (at least 5 images) continuously. Locate a bounding box for a chosen object which can be done either manually or automatically. Assuming object is not going away from the initial bounding box, try to find a your own feature descriptor such as SIFT for the bounding box and calculate same feature descriptor for successive images as well. Then, apply a similarity measurement technique to see the similarity. Explain characteristics of your feature descriptor while mentioning why you choose those characteristics result in the report. **(Points: 5.5, if you use SIFT without your own feature descriptor, you would get up to 3.5 at max.)**

3 Submit

What should you turn in? Please, upload the single zip file which includes your source code (task 01 and task 02), dataset you used task 01 and report for both tasks.

4 Deadline

The deadline: March 4, 23:59:59 GMT+3.