

# colabs



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<b>INSTITUTE/LAB</b>	Institute for Systems and Robotics
<b>PROJECT TITLE</b>	Object 3D pose estimation
<b>PROJECT DESCRIPTION</b>	With recent advances on deep learning and computer vision techniques, it is possible to retrieve the 3D pose (position and orientation) of a known object based on its model and using normal RGB cameras. Moreover, the YCB object dataset was developed for facilitating benchmarking in robotic manipulation. Therefore, the goal of this project is to train a deep neural network to detect the YCB objects in the images and infer their 3D poses. Then, it will be possible to use this information to guide a robotic arm towards the target object (e.g., on the Vizzy Humanoid Robot).
<b>WORK FIELD/CONCEPTS</b>	Computer Vision, Machine Learning, Robotics
<b>NUMBER OF VACANCIES</b>	2
<b>STUDENT PROFILE</b>	Organized, sociable, responsible, committed and hard-working
<b>REQUIRED SKILLS</b>	Basic knowledge of programming, C/C++ or Python programming is a plus. Reading scientific reports.
<b>OBJECTIVES</b>	Exploiting the OpenCV library (written in C++ and Python languages) to train a neural network to detect the 3D pose (position and orientation in 3D space) of the objects on the YCB dataset. Test the algorithm with simulated objects on a game engine and with the real objects on the Vizzy's cameras. Grasp the object (if we have time)
<b>NECESSARY EQUIPMENT</b>	Laptop
<b>DURATION</b>	~16 weeks (Start: March 19th; Finish: July 6th; it is Flexible)
<b>RECOMMENDED SCHEDULE</b>	1 afternoons a week (1 afternoon = 4h)