Problem description:
Object manipulation is a common task that a human-robot team need to perform. In that sense, the agents need to coordinate their activity and perform this task cooperatively. In order to cooperatively manipulate an object, it is very important to obtain as much information as possible regarding the object and its kinematic/dynamical model. The identification/exploration of an object’s model can benefit from various sensors that a robot is equipped with and a human can be equipped with. This identification strategy should incorporate visual/haptics information arising from different agents and efficiently fuse the information.

The aim of this project would be to develop an object exploration control strategy by which the human-robot team would identify the object’s kinematics/dynamics. Prior to that, a necessary investigation needs to be done in order to find out what kind of information about the object can be obtained from visual/haptic sensors equipped on both human and robot side. Lastly, the proposed exploration strategy should be incorporated in the cooperative adaptive control loop for object manipulation.

Tasks:
• Literature research related to the kinematic/dynamic object model identification strategies
• Proposal of an object exploration strategy
• Simulation of the initially proposed approach in Matlab/Simulink
• Evaluation of the proposed method in a human-robot cooperative object manipulation scenario

Bibliography: