Student Projects

Short descriptions (more info and references by request):

1. Planning and implementing stable grasps for non-stiff objects by industrial robot ABB IRB140:

   The task assumes planning a way the gripper should approach an object of known location, orientation and geometry to grasp and manipulate it without losing the contact with the object. It is required to develop the program in Robot Studio, software interface of the gripper installed on ABB IRB 140, experiment and analyze the performance.

2. Planning and stabilization of a gait for a quadruped robot:

   Modeling, motion/trajectory planning and controller design for quadrupeds. The task is to model the dynamics of a robot (think of a Boston Dynamics BigDog) and search feasible gaits for the model that will be consistent with dynamic and kinematic constraints imposed on the model. The next task is to design feedback controllers that achieve orbital stabilization of the found gaits.

3. Searching walking and running gaits for passive or partly controlled compass-gait 2D walker:

   The task requires developing a hybrid model of robot dynamics, procedures for representation of its motions, steps in searching symmetric or asymmetric gaits, analysis of their stability and sensitivity to parameters.

4. Experiments with motion and forced control strategies for milling applications by an industrial robot-manipulator:

   The task is to enter the literature in the topic and prepare and run experiments on ABB IRB 4600 for realizing the milling and polishing assignments by an industrial robot manipulator