Home task 4: Dynamics

Task:

1. Derive dynamic model for your robot model using the Euler-Lagrange approach.

$$M(q)\,\ddot{q} + C(q, \dot{q})\,\dot{q} + g(q) = \tau$$

2. Drive the robot joints between $[0, \pi]$.
    - Drive the robot using a trapezoidal profile. (from assignment 3)

3. Plot torques.

References:

You can find useful information about matrix approach in chapter 7 about dynamics in "1) B. Siciliano, L. Sciavicco, L. Villani, G.Oriolo, "Robotics: Modelling, Planning and Control", 3rd Edition, Springer, 2009".

Submission:

- A report containing your full derivation of the dynamic model
- Code implementation for calculating $M(q)$, $C(q, \dot{q})$, $g(q)$
- Torque plots for all tasks

Bonus:

- Drive the robot between two points using a polynomial profile.
- Drive the robot between multiple points using trapezoidal trajectories
    - In order to do this you need to consider blending
- Plot actual and planned pathes.

What challenges are presented in such approaches? Why won't they be 100% accurate?