Homework assignment 2 - EL2450

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1

Rate Monotonic scheduling is a scheduling method that will predetermine the priority of each task proportional to the tasks activation frequency. The priority is determined at the task creation and will remain unchanged during the whole application.

2

A set of tasks $J = \{J_1, J_2, ..., J_n\}$ is schedulable with RM if

$$U = \sum_{i=1}^{n} \frac{C_i}{T_i} \leq n(2^{1/n} - 1) \tag{1}$$

where C_i is the comutation time, T_i is the period, U is the utilization factor and n is the number of computations. When we have a sampling time of $T = \{20, 29, 30\}ms$ and a computation time of 6 ms each we can see that,

$$\frac{6}{20} + \frac{6}{29} + \frac{6}{30} = 0.707 \tag{2}$$

and with a utilization factor of $U = 0.780$ we can see that the set of tasks J should be shedulable with RM.

3

The pendulums are indeed stabilized. There is however a slight difference in the control performance. From what we can see is the settling time longer the shorter the pendulum gets. Which is correct according to the lab introduction.

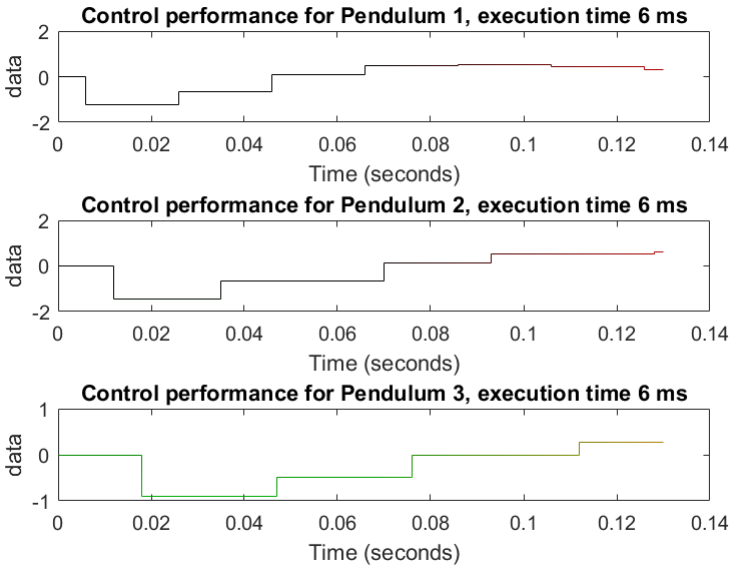

Figure 2: Control signal for pendulum