Homework AORC

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The strategy that leads to the smallest tracking error is the $tanh(2 * dq)$ method . The MSE value referred to various $KpKd$ are listed in Table below

The reason is the fact that the $tanh(2*dq)$ can combine the property of continuity and a good approximation of the step function that characterize the model of Coulomb friction

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The strategy that leads to the highest tracking error is the $tanh(0.01*dq)$ method. The reason is probably that it approximate badly the fisical Coulomb model inducing error in the vicinity of $\dot{q} = 0$

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the main problem is that the sign is a discontinous function so in the proximity of zero it have a infinite derivative. close to this points an small error in the retrive the position/velocity can lead to instantaneous change in the torque value applied and generate oscillation and vibration.

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