

[30.12.2020]

[Feedback MPC for Torque-Controlled Legged Robots]

Summary

SLQ is an efficient method to handle nonlinear optimal problems, however, in the original SLQ paper, the inequality constraints are not considered. In robotics, we need to also consider the inequality force friction cone constrain. In this paper, authors use a barrier cost function to incorporate inequality constraints and keep the main framework of SLQ.

Some key points of this paper:

- frequency dependent cost function is also used following a previous paper: frequency aware MPC
- the first MPC-feedback approach in robotics.

Major Analysis and Comparison

- 1) control inputs consist of contact forces and joint velocities. The torques/acceleration are computed based on those.
 - Feedforward: acceleration are computed by the hierarchical inverse kinematics, see paper not mit_wbc_mpc
 - feedback: acceleration is computed by rollout of the current policy (the desired acceleration)

Thoughts

- 1)
- 2)