ECE209AS (Fall 2025)

Computational Robotics

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Problem set 5 | Linear quadratic regulators

Due Tue, Oct 28, 2025 @ 9am PT

Key takeaways

After this lecture, you should understand:

- How the dynamic programming technique used in value iteration on discrete space problems can be adapted for some continuous space problems;
- What constraints on the continuous space system are necessary to do so, giving the linear quadratic regulator (LQR); and
- When and how to use the closed form LQR solution.

Assignment

5(a). In two to three English sentences, describe what modifications you would need to make to the LQR formulation in order to have a given system follow a prescribed trajectory $x_d(t)$ (as opposed to specifically driving the system's state to $x = 0$).

5(b). Would you be willing to let us use your correct responses as (anonymized) examples for the class?