

ECE183DA (Winter 2022)

Design of Robotic Systems I

Prof. Ankur Mehta (mehtank@ucla.edu)

Lecture 5 | Graph search based motion planning

Addendum to lecture videos

Errata

I accidentally left out the final A in the expressions for u, K_H (starting @36:30 in lec05a).

The correct set of equations should be:

$$u = -(R + B^T P_H B)^{-1} B^T P_H A x$$

$$K_H = (R + B^T P_H B)^{-1} B^T P_H A$$

Additional References

There are very many sources for LQR derivations and analysis, including

- Underactuated Systems by Russ Tedrake (MIT)
 - <http://underactuated.mit.edu/lqr.html>
- MIT OCW 16.323, lectures 3-4
 - <https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-323-principles-of-optimal-control-spring-2008/lecture-notes/>
- Stanford EE363, lectures 1-4
 - <https://stanford.edu/class/ee363/lectures/allslides.pdf>

As always, be aware of slight differences in notation.