ECE/MAE7360. Robust and Optimal Control.
Electrical and Computer Engineering, Utah State University

Project #4[1]: Solving Optimal Control Problems Numerically (with RIOTS_95)

Submit via e-mail only.

1. **Project Objectives:** Understand the way of solving optimal control problems (OCP) numerically. Obtain hands-on experience with RIOTS_95 - the MATLAB Toolbox for solving OCPs in solving your own OCP or OCPs.
2. You will be given a student edition (SE) of RIOTS_95 for use with MATLAB R12 under Windows. Please keep it for your own use only. Please observe the copyright requirement.
3. You formulate your own OCP mathematically, write the required MATLAB routines so that your can use RIOTS_95 to solve your OCP.
4. In preparing your "sys_*.m" files, please refer to the three demo OCPs provided in RIOTS_95, i.e., BANG, RAYLEIGH, and GODDARD (see RIOTS_95 User's Manual, page 85-88, and the directory /riots_95/systems/bang/, /riots_95/systems/rayleigh/, /riots_95/systems/goddard/)
5. You are asked to find your own OCP to solve using RIOTS_95. If you cannot find your own OCP, you can choose one from RIOTS_95 User's Manual, page 85-88, excluding OCPs BANG, RAYLEIGH, and GODDARD, of course. You can refer to the ".c" files for other OCPs such as OBSTACLE, LQR, etc listed in RIOTS_95 User's Manual, page 85-88.
6. **Report requirements** include 1) Description of your OCP with a citation, i.e., the source where you found this OCP; 2) The mathematical equations and parameters related to this OCP; 3) Your "sys_*.m" files; 4) Your numerical experimental results; 5) Discussions.

Bonus: If you can solve ALL OCPs listed in RIOTS_95 User's Manual, page 85-88.

NOTE: attached to Project #4 assignment are
1. RIOTS_95 User's Manual (91 pages)
2. RIOTS_95 MATLAB R14 SE (zipped file – ftp from ECE7360 site)
3. An introductory book chapter paper on RIOTS_95.

[1] Get all files, including this file, related to Project #4 by FTP (user name and pass word will be sent to you via email – come to my office if you have any problem)