

Department of Engineering Cybernetics

TTK4215 Adaptive Control

Assignment 4

Problem 1

Problem 4.9 a,b,d,e from Ioannou & Sun.

Try both the instantaneous cost and integral cost versions of the gradient algorithm. You don't have to repeat the derivations from the book. As long as you can state the model in the linear parametric form, you can use table 4.2 on page 222 in the book. Compare the results and answer the following questions:

1. What are the pros and cons of the different methods regarding complexity and properties? (Hint: See table 4.2)
2. In e) you are asked to have a time-varying mass. How does this affect the stability proofs and the underlying assumptions?

Hint: Some Matlab code to get you started has been uploaded to Blackboard. While the template for assignment 1 used ode45 to simulate the adaptive law, this one showcases a different way using a for loop. Use these as starting points for future assignments as well! You are of course welcome to code everything yourselves.