

ECE 618 – Estimation & System Identification

Section 29446 – MK 623 – 5:00-7:00PM Thursdays
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Required Textbooks

Arthur Gelb (ed.), Applied Optimal Estimation, MIT Press, 1974
Lennart Ljung, System Identification Theory for the User, 2e, 1999

Outline

| Date | Topics | Reading |
|------|---------------------------------|---------|
| 1/19 | Introduction & Motivation | L.1 |
| 1/26 | Motivating Example | G.2 |
| 2/02 | Stochastic Processes | L.2 |
| 2/09 | Linear Systems | G.3 |
| 2/16 | Kalman-Bucy Filter | G.4 |
| 2/23 | Simulation & Prediction | L.3 |
| 3/01 | Smoothing | G.5 |
| 3/08 | LTI Models | L.4 |
| 3/15 | Time-Varying & Nonlinear Models | L.5 |
| 3/22 | SPRING BREAK | |
| 3/29 | Nonparametric Models | L.6 |
| 4/05 | Parameter Estimation Methods | L.7 |
| 4/12 | Convergence & Consistency | L.8 |
| 4/19 | Recursive Estimation | L.11 |
| 4/26 | Extended Kalman-Bucy Filter | G.6 |

Notes:

1. Reading assignments are indicated in the outline by G or L (Gelb or Ljung) followed by a chapter number. It is best to read this material before class.
2. The notations used by the estimation community (represented by Gelb) and by the identification community (represented by Ljung) are quite different. That's life; get used to it.
3. There will be a term project and occasional homeworks. Grades will be based upon the term project (70%) and class participation (30%).
4. I will give some of the lectures, and I will ask each of the students to give at most one lecture during the term. If you are giving a lecture, you are to prepare a handout of notes to be distributed to the class.