

Mathematical Statistics

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1. Introduction
2. We're still in review mode here!
3. We're ready to go!
4. We cover the "second important tool for Mathematical Statistics" and introduce the Beta distribution!
5. We cover the third and fourth "important tools for Mathematical Statistics" and introduce the Poisson distribution!
6. We finish up the "Four Important Tools" and get a glimpse of our future in estimation!
7. We begin talking about what we want out of a "good" estimator of the parameter(s) for a given pdf!
8. More unbiased estimation!
9. Parameter Estimation and Convergence for a Sequence of Random Variables...
10. Convergence in Probability
11. (a) Convergence in Probability (continued) and Convergence in Distribution
(b) Convergence in Probability Implies Convergence in Distribution but not the other way around
12. Convergence in Distribution and Slutsky's Theorem
13. The Central Limit Theorem!
14. The Delta Method for pushing functions through asymptotic normality!
15. More than you ever wanted to know about the sample variance for a normal distribution...
16. Confidence Intervals!
17. More Confidence Intervals!
18. More Confidence Intervals and an Introduction to Hypothesis Testing
19. A Mostly Normal Introduction to Hypothesis Testing

20. [Hypothesis Testing Continued](#)
21. [Some "special" hypothesis tests and method of moments estimation!](#)
22. [Maximum Likelihood Estimation!](#)
23. [Maximum Likelihood Estimation and the Cramér-Rao Lower Bound](#)
24. [The Cramér-Rao Lower Bound: A Focus on Computation](#)
25. [Proving properties of MLEs](#)
26. [Asymptotic Normality of the MLE](#)
27. [Another MLE Example and an Intro to Sufficient Statistics](#)
28. [Sufficient Statistics and the Rao-Blackwell Theorem](#)
29. [The Rao-Blackwell Theorem in Action!](#)
30. [Uniformly Minimum Variance Unbiased Estimators](#)
31. [Minimal Sufficient Statistics](#)
32. [Minimal Sufficient Statistics, Ancillary Statistics, and Bahadur's Theorem](#)
33. [Basu's Theorem and an Introduction to Generalized Hypothesis Testing](#)
34. [Best and Uniformly Most Powerful Hypothesis Tests](#)
35. [Uniformly Most Powerful Hypothesis Tests](#)
36. [Generalized Likelihood Ratio Tests](#)
37. [Generalized Likelihood Ratio Tests \(asymptotics!\)](#)

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