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9. Exercise: Possible values of the estimates

Exercises due Apr 15, 2020 05:29 IST Completed

Exercise: Possible values of the estimates

2/2 points (graded)

Suppose that the random variable Θ takes values in the interval [0,1].

a) Is it true that the LMS estimator is guaranteed to take values only in the interval [0,1]?



b) Is it true that the LLMS estimator is guaranteed to take values only in the interval [0,1]?



Solution:

- a) The conditional expectation $\mathbf{E}\left[\Theta\mid X=x\right]$ is a weighted average of the values of Θ , weighted according to the posterior PDF. A weighted average of values in [0,1] must lie in [0,1].
- b) On the other hand, there is no such guarantee for the LLMS estimator. You can see this from the picture in the last example. Or you may consider the example where $X=\Theta+W$, where W can take any real value. Then, the term aX can take any real value, and can therefore fall outside the range [0,1].

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You have used 1 of 1 attempt

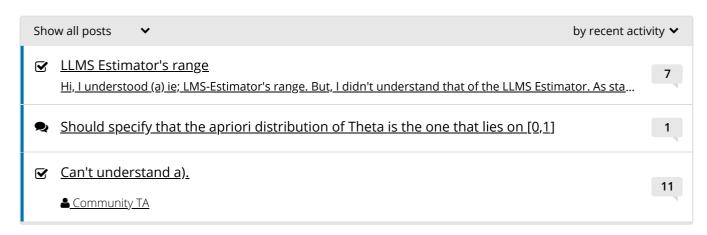
1 Answers are displayed within the problem



Discussion

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Topic: Unit 7: Bayesian inference:Lec. 17: Linear least mean squares (LLMS) estimation / 9. Exercise: Possible values of the estimates



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