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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 $[0, 1]$?

Yes ☐

✓ Answer: Yes

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

No ☐

✓ Answer: No

Solution:

a) The conditional expectation $\mathbf{E}[\Theta \mid X = x]$ 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

i Answers are displayed within the problem



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✓ LLMS Estimator's range

Hi, I understood (a) ie; LMS-Estimator's range. But, I didn't understand that of the LLMS Estimator. As sta...

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💬 Should specify that the apriori distribution of Theta is the one that lies on $[0,1]$

1

✓ Can't understand a).

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