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Exercise: Multidimensional challenges

(2/2 points)

Suppose that f_Θ and $f_{X|\Theta}$ are described by simple closed-form formulas. Suppose that Θ is one-dimensional but X is high-dimensional.

a) Suppose that a specific value x of the random variable X has been observed. Is it true that the calculation of the LMS estimate will always involve only ordinary integrals (integrals with respect to only one variable)?

Yes ✔ **Answer:** Yes

b) Is it true that the calculation of the mean squared error of the LMS estimator will always involve only ordinary integrals (integrals with respect to only one variable)?

No ✔ **Answer:** No

Answer:
a) The denominator in Bayes' rule involves an integral with respect to θ. Once the conditional PDF is available, the LMS estimate is calculated by integrating again over the one-dimensional variable θ.

b) In this case, we need to average the conditional variance over all possible values of x, and this will involve a multiple integral.

You have used 1 of 1 submissions


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