

The wrong direction of Jensen's inequality is algorithmically right

Tuesday, July 11, 2023 12:10 PM (20 minutes)

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Abstract: Let \mathcal{A} be an algorithm with expected running time e^X , conditioned on the value of some random variable X .

We construct an algorithm \mathcal{A}' with expected running time $O\left(e^{E[X]}\right)$, that fully executes \mathcal{A} .

In particular, an algorithm whose running time is a random variable T can be converted to one with expected running time $O\left(e^{E[\ln T]}\right)$, which is never worse than $O(E[T])$.

No information about the distribution of X is required for the construction of \mathcal{A}' .

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Session Classification: Track A-3