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On Schur-Convexity of Expectation of Weighted Sum of Random Variables with Applications

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Abstract: We show that the expectation of a class of functions of the sum of weighted identically independent distributed positive random variables is Schur-concave with respect to the weights. Furthermore, we optimise the expectation by choosing extra-weights with a sum constraint. We show that under this optimisation the expectation becomes Schur-convex with respect to the weights. Finally, we explain the connection to the ergodic capacity of some multiple-antenna wireless communication systems with and without adaptive power allocation.



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