

Bounds on Multi-asset Derivatives via Neural Networks

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Using neural networks, we compute bounds on the prices of multi-asset derivatives given information on prices of related payoffs. As a main example, we focus on European basket options and include information on the prices of other similar options, such as spread options and/or basket options on subindices. We show that, in most cases, adding further constraints gives rise to bounds that are considerably tighter and discuss the maximizing/minimizing copulas achieving such bounds. Our approach follows the literature on constrained optimal transport and, in particular, builds on a recent paper by Eckstein and Kupper [1].

References

- [1] ECKSTEIN, S. AND KUPPER, M., *Computation of optimal transport and related hedging problems via penalization and neural networks*, Applied Mathematics & Optimization (2019), 1-29.