
GUS GUTOSKI, Institute for Quantum Computing, University of Waterloo
On a measure of distance for quantum strategies

The present paper studies an operator norm that captures the distinguishability of quantum strategies in the same sense that the trace norm captures the distinguishability of quantum states or the diamond norm captures the distinguishability of quantum channels. Characterizations of its unit ball and dual norm are established via strong duality of a semidefinite optimization problem. This norm and its properties are employed to generalize a state discrimination result of arXiv:cs/0412102v1 [cs.CC]. The generalized result states that for any two convex sets S, T of strategies there exists a fixed interactive measurement scheme that successfully distinguishes any choice of $s \in S$ from any choice of $t \in T$ with bias proportional to the minimal distance between the sets S and T as measured by this norm. A similar discrimination result for channels then follows as a special case.