
MIZANUR RAHAMAN, BITS Pilani KK Birla Goa Campus

Bisynchronous Games and Positively Factorizable Maps

Bisynchronous games are a special class of non-local games played by Alice and Bob against a referee where players can use entanglement as a resource to optimize their winning probability. In this talk, I will introduce these games and the corresponding probability densities which we call bisynchronous correlations. We establish a close connection with the theory of quantum permutation groups and these correlations. Moreover, when the number of inputs is equal to the number of outputs, each bisynchronous correlation gives rise to a unital quantum channel which will be shown to be factorizable in the sense of Haagerup- Musat. Motivated from this

finding, we further generalize the concept of factorizability and introduce a new class of quantum channels that we call **positively factorizable**. It turns out that there is a close connection between the convex sets in Euclidian space containing self-dual cones and the existence of these maps. In this context, we

find new examples of matrices that are non-negative but not CPSD (completely positive semidefinite). This talk is based on two separate works with Vern Paulsen and Jeremy Leick.