Rank aggregation, medium access and multiplicative weight update

This talk will describe algorithms for the problems of rank aggregation and medium access. I will establish properties of these algorithms and discuss connection to the popular multiplicative weight update rule when applied to a large action space with succinct description.

More precisely, I shall consider the rank aggregation problem in presence of partial information where interest is in predicting popular rankings of a given set of objects (e.g. election candidates, sports teams, cars, etc.) based on limited or partial information about the collective preferences among them. The problem of medium access requires coming up with random access probabilities that can lead to satisfaction of the imposed traffic demands. Both of these problems can be solved by looking for distribution that maximizes entropy subject to the constraints imposed by partial information or demands respectively. The resulting gradient algorithm provides a natural extension of multiplicative weight update rule when one is required to maintain and update weights efficiently in the presence of exponentially large number of actions.