Aggregation of individual rankings through fusion functions: criticism and optimality analysis

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Our main idea is to analyze from a theoretical and normative point of view different methods to aggregate individual rankings. To do so, first we introduce the concept of a general mean on an abstract set. This new concept conciliates the Social Choice where well-known impossibility results as the Arrovian ones are encountered and the Decision-Making approaches where the necessity of fusing rankings is unavoidable. Moreover it gives rise to a reasonable definition of the concept of a ranking fusion function that does

indeed satisfy the axioms of a general mean. Then we will introduce some methods to build ranking fusion functions, paying a special attention to the use of score functions, and pointing out the equivalence between ranking and scoring. To conclude, we prove that any ranking fusion function introduces a partial order on rankings implemented on a finite set of alternatives. Therefore, this allows us to compare rankings and different methods of aggregation, so that in practice one should look for the maximal elements with respect to such orders defined on rankings IEEE.