

Department of Mathematical Sciences

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Colloquium Series

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Combining multiple ranking systems on the Kemeny rank space

Given t ranking systems of n objects, consensus ranking (CR) aims to derive a ranking which best represents the consensus goal of these ranking systems. The CR problem and other similar problems such as preference ranking, rank aggregation, and learning to rank have been studied on the bubble-sort Cayley graph rank space S_n which is the set of all permutations of order n . However, it remains a challenging issue when the combination of ranking systems produces ties which are not included in S_n . Recently, we proposed a unified framework for combining multiple ranking systems using multi-layer combinatorial fusion on the Kemeny rank space K_n where ties are allowed. In this talk, we illustrate this new approach with both simulated and real case examples. We describe a variety of application domains in many disciplines in academia and research and many sectors in industry and government. We also discuss the strength and issues of deep learning and reinforcement learning using combinatorial fusion on the distance-based Kemeny graphical rank space.

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