

Title: Bounds for the Probability of the Union of Events

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Abstract: Given the probabilities of the single events and the probabilities of the intersections of 2 events, we want to find upper and lower bounds for the probability of the union of events. The best bound can be achieved by solving linear programming problems, which need exponential number of variables. Boros et al. (2014) showed that the dual linear programming problems with additional constraints provides sharp polynomially computable bounds. Moreover, Yang et al. (2016) suggests that solution of a relaxed LP problem with $N+N(N-1)(N-2)/2 + 1$ variables coincide with the optimal lower and upper bounds when $N \leq 7$. In this paper, we present the recent discoveries based on Yang's formulation.