

Recent Advances in Polyhedral Combinatorics

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Combinatorial optimization searches for an optimal object in a finite collection; typically the collection has a concise representation while the number of objects is huge. Polyhedral and linear programming techniques have proved to be very powerful and successful in tackling various combinatorial optimization problems, and the end products of these methods are often integral polyhedra or min-max relations. This area of combinatorial optimization is called *polyhedral combinatorics*. In this talk I shall give a brief survey of our recent results on polyhedral combinatorics, including min-max relations on packing cycles, min-max relations on packing feedback vertex sets, a characterization of all matroids with the box max-flow min-cut property, and the complexity of recognizing totally dual integral (TDI) systems.