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Parking Functions, Interpolation Polynomials, and Partition Lattice

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Abstract

Parking function is an object lying in the center of combinatorics and appearing in many discrete and algebraic structures. Originated in the theory of hashing and searching in computer science, parking functions are related to many combinatorial structures. In this talk we discuss the vector parking functions, which correspond naturally to the Goncarov polynomials, the solution of the Goncarov Interpolation Problem in Numerical Analysis. Using the Finite Operator Calculus, we introduce the delta-Goncarov polynomials, develop the algebraic and analytic theory, and show that any such polynomial sequences can be realized as a weighted enumerator in partition lattices, which provides a natural algebraic tool for enumerating combinatorial structures with a linear constraint on their order statistics.