

Signature Tensors of Paths and Their Representation Theory

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In stochastic analysis, a standard method to study a path X is to work with its signature, which is a sequence of tensors that encode in a compact form the information carried by X . The set of tensors that arise as the signatures of paths can be given the structure of an algebraic variety, called universal variety. This allows us to use powerful geometric techniques to study paths. After a suitable change of coordinates, the universal variety is a weighted analogue of the Veronese variety. Viewing this change of coordinates from the point of view of representation theory naturally leads us to some deep problems in algebraic combinatorics. In my talk I will report on a work in progress, joint with Carlos Améndola, Francesco Galuppi, Angel Rios and Pierpaola Santarsiero, where we explore these interactions between algebraic geometry, representation theory, algebraic combinatorics, and signature tensors.