

Signature matrices of membranes

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The k -th level signature of a parametrized surface is a tensor whose entries are iterated integrals. We study algebraic properties of such membrane signatures, with a focus on signature matrices of polynomial and piecewise bilinear membranes. Generalizing known results for path signatures, we show that the two families of membranes admit the same set of signature matrices and we examine the corresponding affine varieties. In particular, we prove that there are no algebraic relations on signature matrices of membranes, in contrast to the path case. We complement our results by a linear time algorithm for the computation of signature tensors for piecewise bilinear membranes. This talk is based on joint work with Leonard Schmitz.