

Learning Paths from Signature Tensors

Anna Seigal, UC Berkeley

Matrix congruence extends to the setting of tensors. We apply methods from tensor decomposition, algebraic geometry and numerical optimization to this group action. Given a tensor in the orbit of another tensor, we compute a matrix which transforms one to the other. Our application is an inverse problem from stochastic analysis: the recovery of paths from their signature tensors of order three. We give identifiability results and recovery algorithms for piecewise linear paths, polynomial paths, and generic dictionaries. This is based on joint work with Max Pfeffer and Bernd Sturmfels.