

# Latent Polytopes Recover Generative Models

Algorithms with proven polynomial time bounds are known for Mixture Models of Gaussians and some other special distributions. Admixtures are generalizations of mixtures where each sample is drawn from a different combination of the basic component distributions. Admixtures have been used in many applications, but, until recently, algorithms with proven error and time bounds were only known for a few special cases of admixtures like Topic Modeling (TM). After surveying these, the talk will focus on the recently introduced “Latent polytope problem” (LPP):

Given highly perturbed points from a latent polytope, find its vertices.

LPP includes as special cases all admixtures and some non-admixture models like Mixed Membership Community Detection. We define a notion of “well-conditioned” LPP, and show that common generative models under assumptions made in the literature are well-conditioned. The central results we describe are a polynomial time algorithm for solving well-conditioned LPP’s and a bound on their Sample Complexity.

The talk will be self-contained, in particular explaining all terms here.