

Learning Ricci-flat metrics on Calabi-Yau manifolds

Andre Lukas

We discuss recent progress in computing Ricci-flat metrics on Calabi-Yau manifolds using machine learning techniques. Similar machine-learning methods can also be applied to compute related quantities, such as Hermitian-Yang-Mills connections on bundles and harmonic forms, I will briefly discuss the relevance of these methods in the context of string theory and, in particular, explain how they facilitate the computation of particle masses directly from string theory. Finally, I will present approximate analytic Ricci-flat metrics on Calabi-Yau manifolds, obtained from the machine-learning results by a combination of traditional fitting and symbolic regression.