

Update on the use of Artificial Neural Networks in cosmology

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“Nonparametric reconstructions of cosmological parameters from observational data sets are usually associated with Gaussian processes (GP). It is known though, that GPs are plagued with overfitting issues and they introduce some statistical bias through the selection of the kernel. The last few years, with the advent of Machine Learning, artificial neural networks are being used in cosmology for the reconstruction of parameters in a model independent way, both from the physical and from the statistical point of view. In this talk, I will present the use of ANNs in cosmology and I will show how we expanded an existing neural network, to include non-Gaussian data points, as well as data sets with covariance matrices. I will also apply our algorithm in scalar-tensor models and I will present the stricter bounds we found on their arbitrary functions, compared to Gaussian processes.”

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