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Nonparametric Techniques to Reconstructing Cosmological Data

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Cosmological tensions in recent measurements of both Hubble expansion and the growth of structure in the Universe has led to a reconsideration of certain aspects of the concordance model of standard cosmology. One part of this comes from the growing tension between observations that are independent of cosmological models against others that are dependent on ΛCDM. To this end, the ability of reconstruction techniques to provide efficient and effective extractions of cosmological data has become ever more pressing. In this talk, some recent approaches to the problem are explored such as the use of Gaussian processes and the Locally weighted Scatterplot Smoothing together with Simulation and extrapolation method (LOESS-Simex) together with their advantages and disadvantages. The talk will also cover how genetic algorithmics may help improve the performance of these approaches. We close with a look at how deep learning may help improve the ability of these approaches to produce reconstructions of cosmic data

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