ON SAMPLING THE THINGS THAT DO NOT MATTER

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ABSTRACT

We discuss three distinct computational workflows aimed at discovering common and uncommon features between distinct data streams: two are based on spectral methods, in particular, versions of Diffusion Maps -Alternating Diffusion [1] and Output-Informed Diffusion Maps [2]; the third is based on a recently introduced Conformal Autoencoder Neural Network architecture [3]. When the streams include partial observations of the same phenomenon (e.g. multiple time series from two different dynamical systems) the approach will provide an intrinsic parametrization of what is common between the two streams (and therefore pertains to the phenomenon observed) and -in addition- a parametrization of what is uncommon (and therefore pertains to the individual observation stream). It is precisely this parametrization of ``the things that do not matter" to the observed phenomenon that allows us to correctly sample level sets of observations of one of the streams that are consistent with a single given observation of the other stream.

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