

Sparse Čech filtrations, persistent cohomology and projective coordinates

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One of the main challenges in topological data analysis is to turn computed topological features, such as barcodes, into insights about the data set under analysis. We will show in this talk how the persistent cohomology of sparse Čech filtrations, in dimensions 1 and 2, can be used to construct robust representations of the data in the real and complex projective spaces. Examples will be presented in order to illustrate how projective coordinates provides a framework for topology-driven nonlinear dimensionality reduction, and geometric model generation.