

Institut fuer Geometrie

Gastvortrag

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An Approximate Nerve Theorem

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The Nerve Theorem is an implicit tool in most application of topological data analysis relating the topological type of a suitably nice space with a combinatorial description of the space, namely, the nerve of a cover of that space. It is required that it is a good cover, that each element and intersection is contractible or at least acyclic. In this talk, I will describe a weaker condition we call an epsilon-acyclic cover. It encodes the idea that if a cover is almost a good cover, the persistent homology of a filtration computed on the nerve is a good approximation of the persistent homology of a filtration on the underlying space. The main application of this result is to reduce the computational burden for computing persistence by allowing the use of coarser representations of the space (e.g. smaller simplicial complexes). I will also describe how to obtain explicit error bounds from local computations.

Michael Kerber