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Kernel method for persistence diagrams via kernel embedding and weight factor

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In topological data analysis (TDA), persistence diagrams are widely recognized as a useful descriptor of complicated data, and can distinguish robust and noisy topological properties. While persistence diagrams start to be applied to various problems, statistical or machine learning methods to analyze persistence diagrams are still limited. Hence, developing a statistical framework for persistence diagrams is a significant issue for further success of TDA. Since a persistence diagram is a point set of variable size, it is not straightforward to apply standard methods for statistical data analysis. Here, to introduce statistics into TDA, we construct kernel method for persistence diagrams.

Reference: Genki Kusano, Kenji Fukumizu and Yasuaki Hiraoka. "Persistence weighted Gaussian kernel for topological data analysis". Proceedings of the 33rd International Conference on Machine Learning (ICML), JMLR: W&CP volume 48, pp:2004--2013, 2016.
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