Probability Measures on Persistence Diagrams

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Abstract: We study the structure of collections of persistence diagrams that arise from taking the Vietoris-Rips filtration of all n-tuples of points from a given weighted metric space. We consider what is the induced probability measure on that collection, and study stability of this measure in the Gromov-Wasserstein sense. These ideas provide a notion of statistics over persistence diagrams which is robust to perturbations in the input weighted metric spaces. The construction has applications in shape discrimination.