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## Omer Bobrowski -Universality in Random persistence Diagrams

*Tuesday, October 11, 2022 2:30 PM (1 hour)*

One of the most elusive challenges within the area of topological data analysis is understanding the distribution of persistence diagrams. Despite much effort, this is still largely an open problem. In this talk we will present a series of conjectures regarding the behavior of persistence diagrams arising from random point-clouds. We claim that, viewed in the right way, persistence values obey a universal probability law, that depends on neither the underlying space nor the original distribution of the point-cloud. We back these conjectures with an exhaustive set of experiments, including both simulated and real data.

We will also discuss some heuristic explanations for the possible sources of this phenomenon. Finally, we will demonstrate the power of these conjectures by proposing a new hypothesis testing framework for computing significance values for individual features within persistence diagrams.

This is joint work with Primoz Skraba (QMUL).