RANDOM DIFFERENTIAL TOPOLOGY

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In my Phd thesis [1] I developed some general methods to study the topological and geometric properties of random smooth maps. This topic is at the crossroad of Differential Topology and Probability.

In this talk, I will present such methods by studying the expected topology of singular sets of random (Kostlan) polynomials, when the degree grows to infinity [3].

This involves a generalization of the Kac-Rice formula [2], a probabilistic version of Thom transversality theorem [4], a Morse inequality for stratified manifolds [3] and a deterministic result on the behavior of Betti numbers under continuous perturbations [3].

This is a joint work with Antonio Lerario.

REFERENCES

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[3] LERARIO A. AND STECCONI M., *Maximal and Typical Topology of Real Polynomial Singularities*, Annales de L'Institut Fourier, to appear, 2019.

[4] LERARIO A. AND STECCONI M., *Differential Topology of Gaussian Random Fields*, arXiv, 2019.

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