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Title: Persistence theory and its relation with neural network's generalisation capacity.

Abstract:

During the last few years, deep learning has become one of the most fruitful and powerful techniques to tackle complex problems in science and industry. However, we still do not fully know which properties of the neural networks make them generalize better in a specific context.

In this talk, we will explain how topology can help us predict the performance of a neural network on a task without the need for a test dataset. To do this, we will apply persistent homology on the space of activation values of the neural networks to predict, using linear models, the generalization gap, a performance measure of a neural network.