

## عنوان مقاله:

Analyzing the Inference Process in Deep Convolutional Neural Networks using Principal Eigenfeatures, Saturation and Logistic Regression Probes

## محل انتشار:

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## خلاصه مقاله:

The predictive performance of a neural network depends on the one hand on the difficulty of a problem, defined by the number of classes and complexity of the visual domain, and on the other hand on the capacity of the model, determined by the number of parameters and its structure. By applying layer saturation and logistic regression probes, we confirm that these factors influence the inference process in an antagonistic manner. This analysis allows the detection of over- and under-parameterization of convolutional neural networks. We show that the observed effects are independent of previously reported pathological patterns, like the "tail pattern". In addition, we study the emergence of saturation patterns during training, showing that saturation patterns emerge early in the optimization process. This allows for quick detection of problems and potentially decreased cycle time during experiments. We also demonstrate that the emergence of tail patterns is independent of the capacity of the networks. Finally, we show that information processing within a tail of unproductive layers is different, depending on the topology of the neural network architecture.

## کلمات کلیدی:

convolutional neural networks, logistic regression probes, saturation, eigenfeatures, tail pattern

## لینک ثابت مقاله در پایگاه سیویلیکا:

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