

1154-60-1357 **Boris Hanin*** (bhanin@math.tamu.edu), **Mihai Nica** and **Grigoris Paouris**. *Random Matrix Products in Deep Learning*.

Deep learning is the study and application of neural networks. Each network is a non-linear family of functions, and such families form the backbone for many state of the art machine learning tasks ranging from computer vision to natural language processing.

Several numerical stability questions about neural networks reduce to studying products of N independent matrices of size $n \times n$ in the regime where both the size n and the number of terms N tends to infinity. I will discuss joint work with Mihai Nica (Toronto) as well as work with Grigoris Paouris (Texas A&M) about the linear statistics and spectral theory of these matrix models. (Received September 15, 2019)