EP-IT Data science seminars

SPEAKER: Naftali Tishby

TITLE: **On the Statistical Mechanics and Information Theory of Deep Learning, for Particle Physicists**

DATE: 15 Apr 2019, 11:15

PLACE: 500-1-001 - Main Auditorium

ABSTRACT

This is an introduction to Deep Learning, for Particle Physicists. These techniques can provide excellent performance for separating different categories of events, pattern recognition, etc. In order to achieve this it is highly desirable for users to understand the basic concepts underlying their operation. The Statistical Mechanics and Information Theory aspects of this will be addressed in this talk. Specifically, I will describe how the layers of deep neural networks, trained with stochastic gradient decent, are organized when the problem has specific continuous symmetry. According to our theory, the critical slowing down of any gradient based optimization of the training error is causing the layers to organize by irreducible representations of the underlying symmetry. This is a joint event of PHYSTAT, the LPCC IML Workshop and the CERN-EP/IT Data Science seminar. As a follow-up to the lecture, there will be an informal `Question and Answer' session with Prof Tishby on Tuesday April 16th at 2.15pm in the IT Auditorium (Room 31/3-004). Please come along with your questions

Organised by: M. Girone, M. Elsing, L. Moneta, M. Pierini..........
Coffee will be served at 10h45