Mini-workshop on lattice gauge theory and related topics for high-energy physics

Report of Contributions

https://indico.phys.nthu.edu.tw/e/mini_latt_2025

Contribution ID: **7** Type: **not specified**

Opening

Wednesday, 14 May 2025 09:30 (15 minutes)

Presenter: Prof. LIN, C.-J. David (National Yang Ming Chiao Tung University)

Contribution ID: **8** Type: **not specified**

Machine Learning for Parton Distribution Functions

Wednesday, 14 May 2025 09:45 (45 minutes)

The NNPDF collaboration has been using Machine Learning techniques to solve the inverse problem of extracting Parton Distribution Functions from finite sets of experimental data for almost two decades. With the increased precision of the LHC measurements, It has become mandatory to understand the robustness of the error bars and of the correlations in the results of PDFs fit. We review the fitting procedure from a Bayesian perspective and discuss the training of neural networks in a Bayesian framework.

Presenter: Prof. DEL DEBBIO, Luigi (University of Edinburgh)

Contribution ID: **9** Type: **not specified**

TMD soft function on the lattice using complex directional Wilson lines

Wednesday, 14 May 2025 11:00 (45 minutes)

Presenter: Dr MORRIS, Wayne (National Yang Ming Chiao Tung University)

Contribution ID: **10** Type: **not specified**

Tackling the Signal to Noise problem with Stochastic Automatic Differentiation

Wednesday, 14 May 2025 11:45 (45 minutes)

Lattice field theory computations of two-point functions are generally affected by the so called signal to noise problem, wherein the signal of the Euclidean time correlator decays faster than the variance. In this talk we propose a different perspective on the origin of this problem. Following this, we argue that by writing correlators as derivatives with respect to sources and evaluating these derivatives using techniques of stochastic automatic differentiation we can eliminate completely the signal to noise problem. Results in a four dimensional scalar theory confirm the expected behavior.

Presenter: Dr CATUMBA, Guilherme (University of Milano)

Contribution ID: **11** Type: **not specified**

TBA

Wednesday, 14 May 2025 14:00 (45 minutes)

Contribution ID: **12** Type: **not specified**

TBA

Wednesday, 14 May 2025 14:45 (45 minutes)

Contribution ID: **13** Type: **not specified**

TBA

Wednesday, 14 May 2025 16:00 (45 minutes)

Contribution ID: **14** Type: **not specified**

Discussion

Wednesday, 14 May 2025 16:45 (45 minutes)