

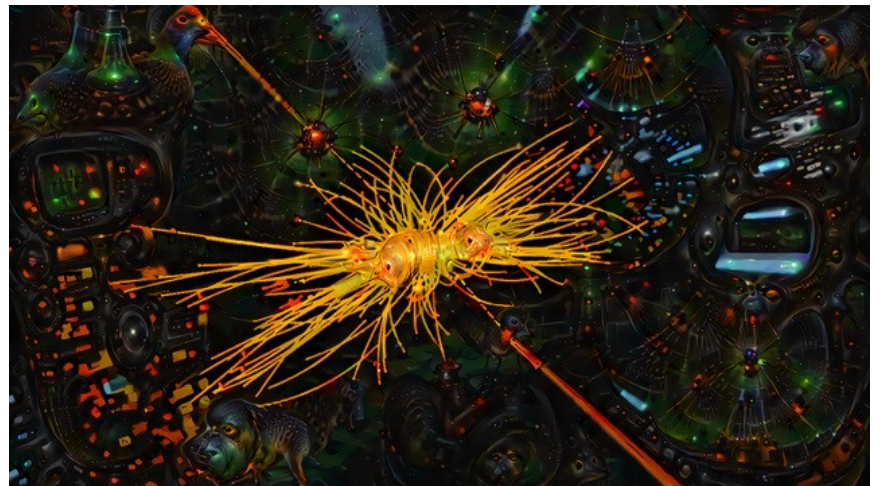


Deep Learning at the LHC: Tagging Resonances & Discovering New Physics.

Tuesday, 09 April 2019

DESY Auditorium, 16:45 h

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(Univ. Hamburg)**



Many experimental results from both particle and astrophysics hint that the Standard Model (SM) of particle physics cannot be a complete theory of Nature. However, in its first years of operation, the LHC was very successful in excluding large regions of parameter space for potential models beyond the SM. We present how deep learning – algorithms based on neural networks with large numbers of internal layers – can be used to search for deviations from the SM. Specifically, we discuss how to efficiently identify hadronically decaying top quarks. Furthermore, we show that unsupervised learning based on deep autoencoders can be directly trained on data and used for model-independent searches for new physics – reducing experimental systematic uncertainties and reliance on specific theories at the same time. Beyond autoencoders, we discuss other physics scenarios as well as wider applications of deep learning.

- **Coffee, tea and cookies will be served at 16:30h**
- **After the colloquium there is a chance for private discussions with the speaker over drinks and pretzels**