

## Finding heavy resonance decays using deep learning

*Dr. Gregor Kasieczka*

*ETH Zürich, Schweiz*

Deep learning is a novel development in computer science, based on creating computational models that feature multiple layers and correspondingly increasingly higher levels of abstraction. Convolutional neural networks - a subset of deep learning techniques - are now the dominant approach for image recognition. Typical problems in high energy physics, such as the identification of highly energetic top quarks or Higgs bosons can be viewed as image recognition tasks. We show how the identification of hadronically decaying top quarks can be recast as image recognition task and compare the performance of a convolutional network to a multivariate QCD-based top tagger. We also discuss related work such as using recursive neural networks and adversarial training approaches.