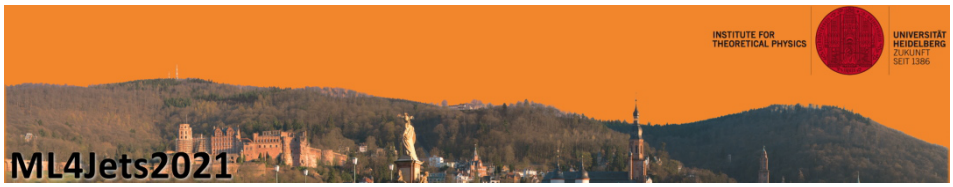

Contribution ID: **53** Type: **not specified**

Combine and Conquer: Event Reconstruction with Bayesian Ensemble Neural Networks

Wednesday 7 July 2021 09:00 (20 minutes)

Ensemble learning is a technique where multiple component learners are combined through a protocol. In this talk, we will present an Ensemble Neural Network (ENN) that uses the combined latent-feature space of multiple neural network classifiers to improve the representation of the network hypothesis. We apply this approach to construct an ENN from Convolutional and Recurrent Neural Networks to discriminate top-quark jets from QCD jets. Such ENN provides the flexibility to improve the classification beyond simple prediction combining methods by linking different sources of error correlations, hence improving the representation between data and hypothesis. In combination with Bayesian techniques, we show that it can reduce epistemic uncertainties and the entropy of the hypothesis by simultaneously exploiting various kinematic correlations of the system, which also makes the network less susceptible to a limitation in training sample size.

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