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Learning the language of QCD jets with transformers

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Transformers have become the primary architecture for natural language processing. In this study, we explore their use for auto-regressive density estimation in high-energy jet physics. We draw an analogy between sentences and words in natural language and jets and their constituents. Specifically, we investigate density estimation for light QCD jets and hadronically decaying boosted top jets. We exploit the generative capability of our setup to assess the quality of the density estimate. Our results indicate that the generated data samples closely resemble the original data, in particular since they are difficult to distinguish from the original data even by a powerful supervised classifier.

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