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Title:	Symmetry Aware Machine Learning.
Authors:	Poudyal, Siddhant
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Abstract:	We investigate an equivariant neural network architecture that is equivariant with respect to operations of the Lorentz group. The basis of the architecture is the Equivariant Universal Approximation, which specifies constraints for any architecture so that it effectively simulates physical processes. We demonstrate that an equivariant architecture like this has fewer learnable parameters with its components being much more physically interpretable for classification tasks like top tagging in particle physics. The performance of the neural network is measured using the Top Quark Tagging Reference Dataset [1], for tagging hadronic top quark decays given the 4-momenta of jet constituents.
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