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Boosting DM searches at the LHC with deep learning

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We investigate how DM searches at the LHC can be improved by Deep Learning techniques. We look at the task of finding semi-visible jets arising from a dark sector model that couples to the SM. Finding this signature has been shown to be difficult compared to multi-prong decays from new heavy resonances. The task can be tackled with varying amount of supervision during training, trading sensitivity for independence of a given signal model. We examine this tradeoff for fully supervised, weakly supervised and unsupervised methods. We find that significant sensitivity boosts are possible also in a model agnostic setup.

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